

# Center for Reconstructive Urethral Surgery



**GUIDO BARBAGLI M.D.**

**Arezzo - ITALY**

**e-mail: [info@urethralcenter.it](mailto:info@urethralcenter.it)**

**Website: [www.urethralcenter.it](http://www.urethralcenter.it)**

# **Tunisian Urological Society**

## **European School of Urology**

**Course on:  
Evaluation of male sexual dysfunction and  
urethral stricture surgery**

**Tunis - Tunisia**

**May 29, 2009**



# **Evaluation and treatment of urethral strictures**

# Evaluation of urethral stricture

**Urethrography**

- **Retrograde**
- **Voiding**
- **Combined**

**Ultrasonography**

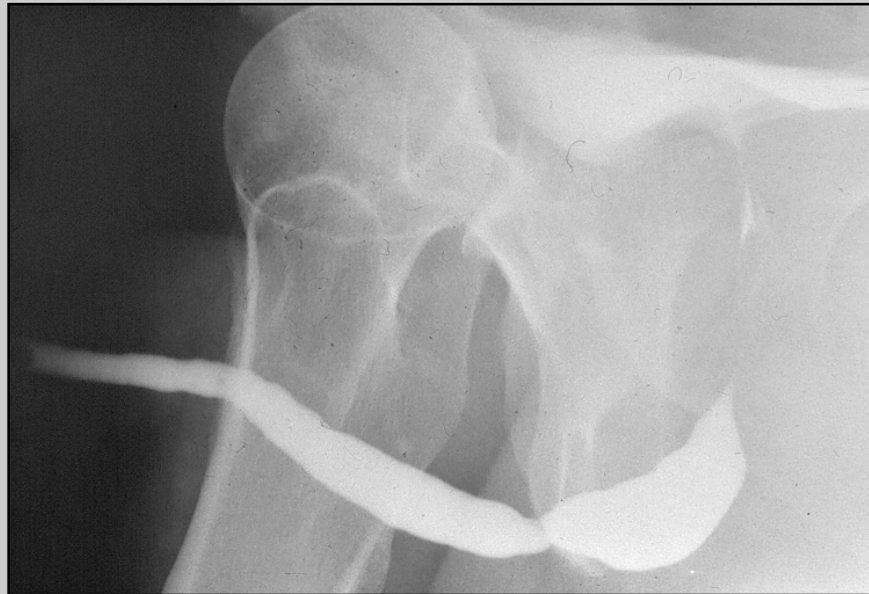
**Urethroscopy**

# Object of the preoperative evaluation of urethral stricture

- Site
- Number
- Length
- Spongiofibrosis
- Associated conditions

# Retrograde urethrography

## Site

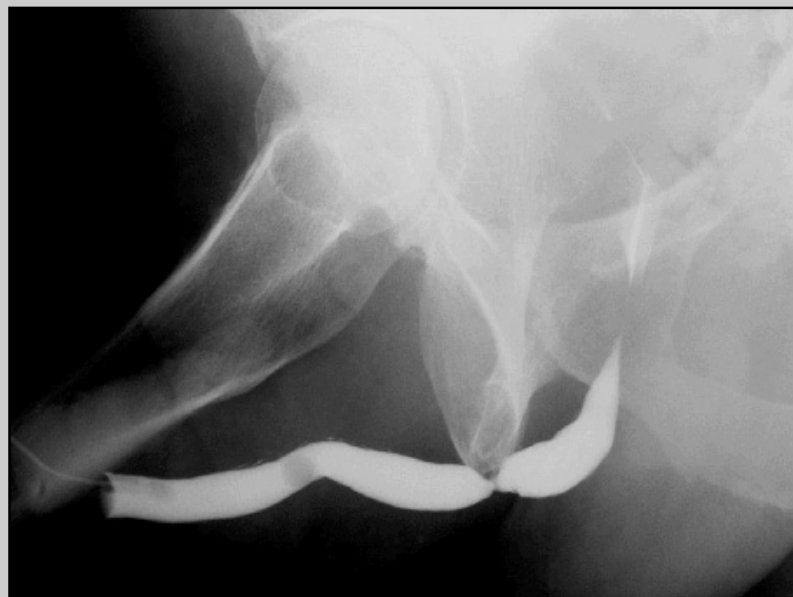


**Penile or bulbar ?**

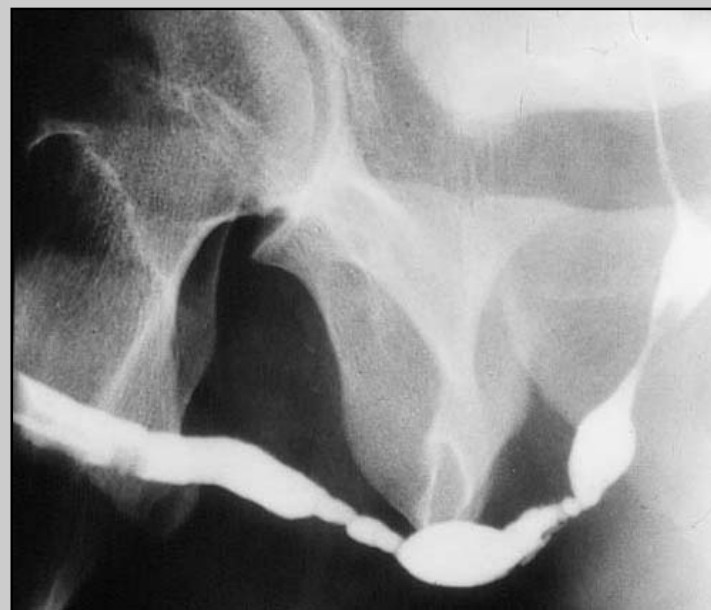
**Bulbar: distal or proximal ?**

# Retrograde urethrography

## Number



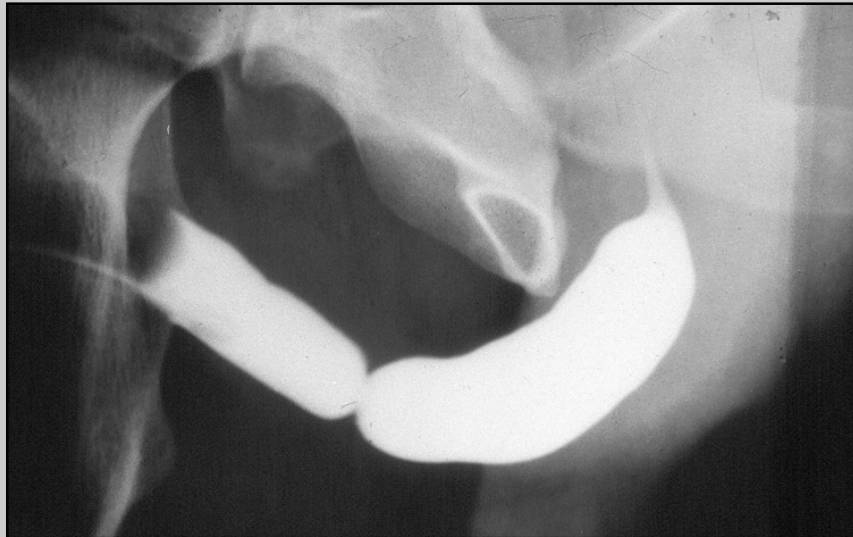
**Single or double ?**



**Penile and bulbar ?**

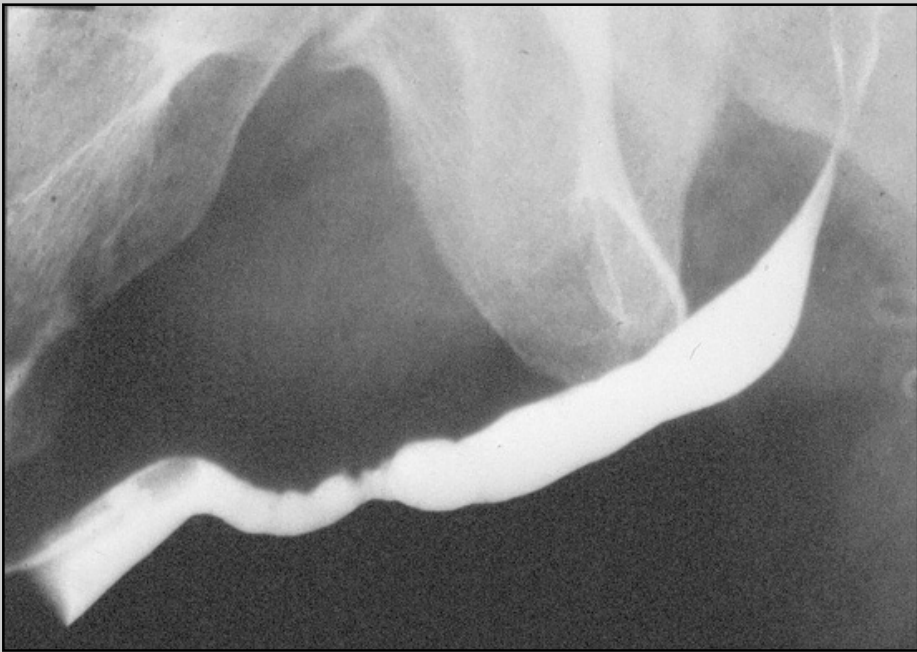
# Retrograde urethrography

## Length



# Retrograde urethrography

## Spongiofibrosis



**wide urethral plate**



**scarred urethral plate**



# Retrograde urethrography



**No-oblitative**



**oblitative**

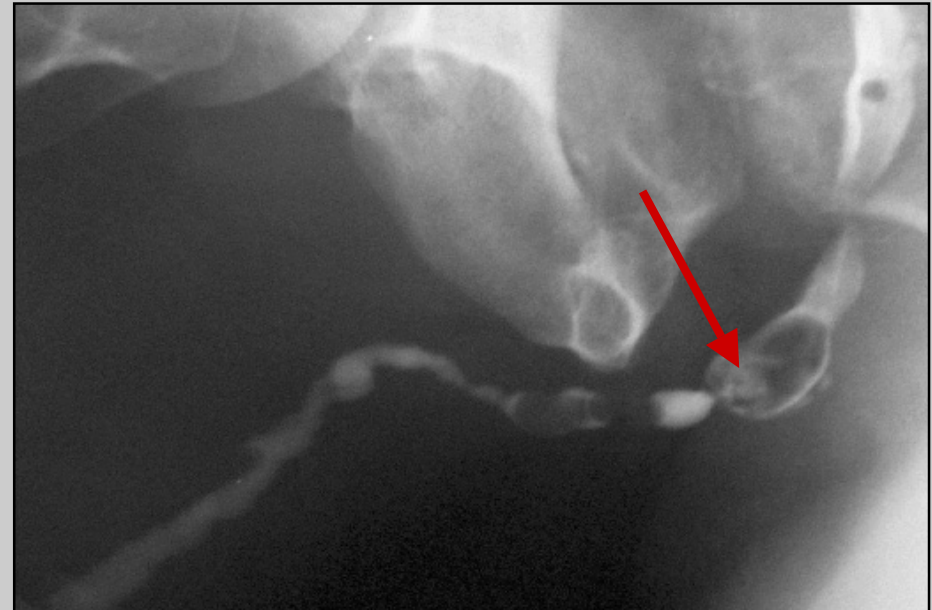


# **Retrograde urethrography**

## **Associated conditions**

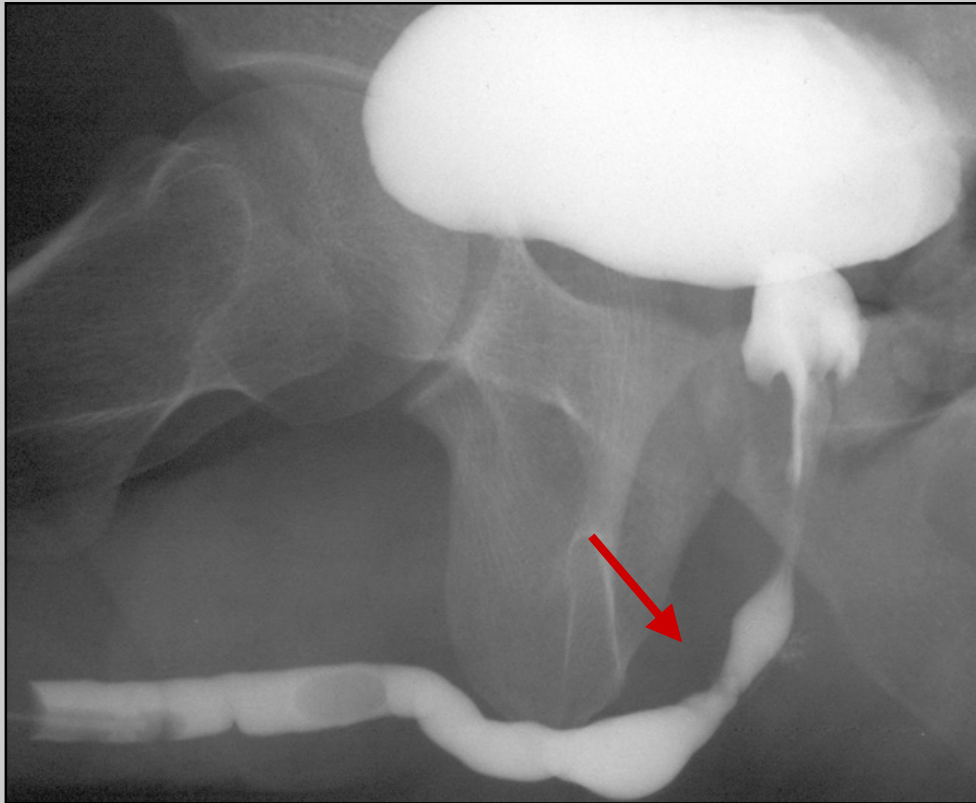


**diverticulum**

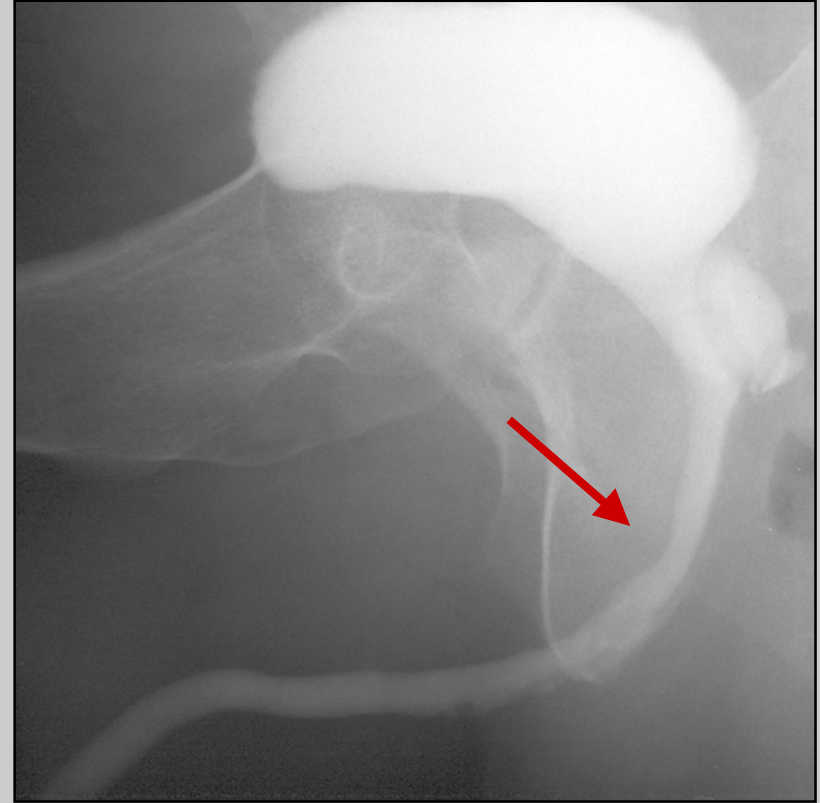


**stone**

# Voiding urethrography



**Retrograde**



**Voiding**

# Voiding urethrography

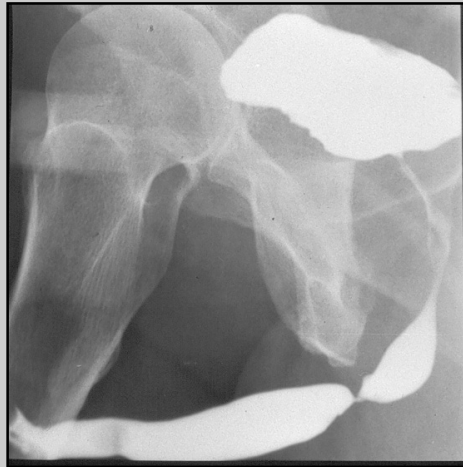


**Retrograde**

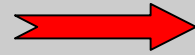


**Voiding**

# Voiding urethrography

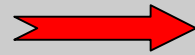


**Retrograde**



**Voiding**

**Delayed treatment**



**No-delayed treatment**



**Voiding urethrography in patients who  
underwent bulbar urethroplasty:  
evaluation of the outcome**



**good**



**satisfactory**



**poor**

# Combined cystourethrography in patient with traumatic posterior urethral stricture

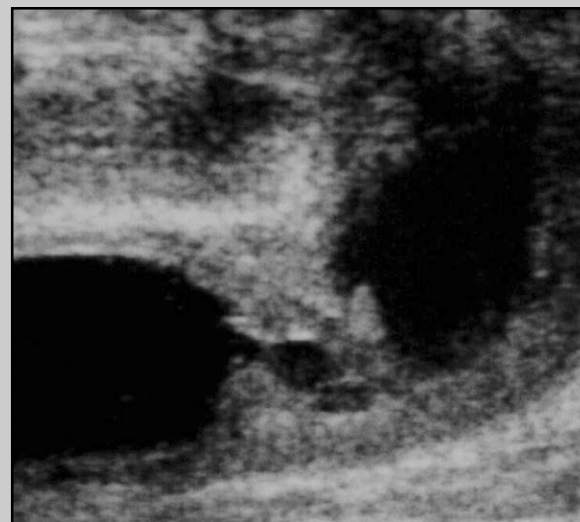
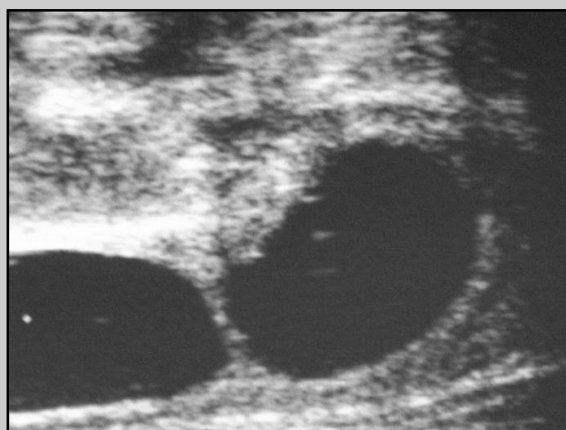




# Urethral sonography

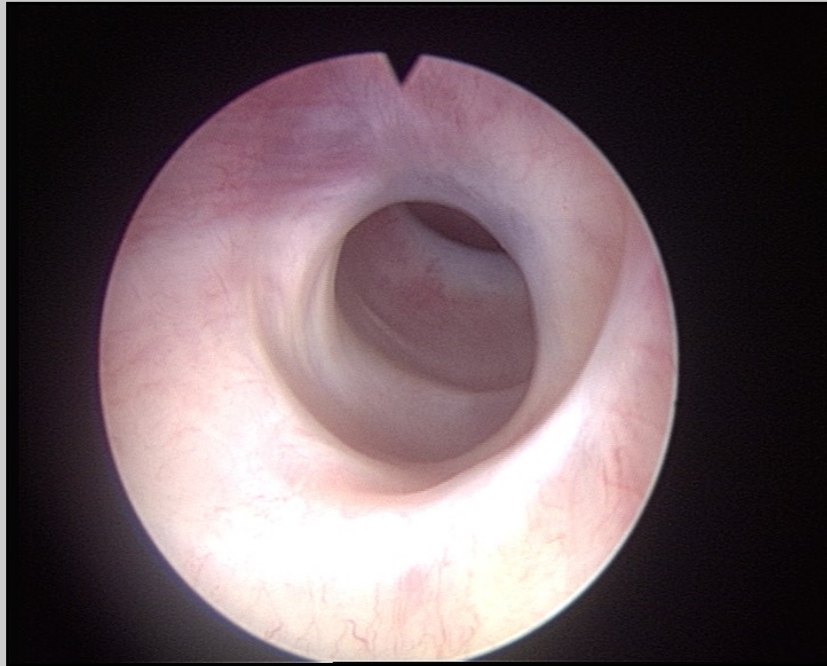


# Stricture length and spongiofibrosis





# Urethroscopy



**No-oblitative**



**oblitative**

# **Anterior urethral stricture**

## **Urethrotomy or urethroplasty ?**

**Easy and quick procedure or complex and long  
procedure ?**

# Stricture etiology

## Urethrotomy ?

### NO

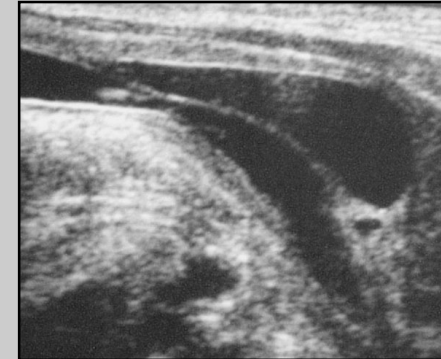
- failed hypospadias repair
- lichen sclerosus
- traumatic stricture

### YES

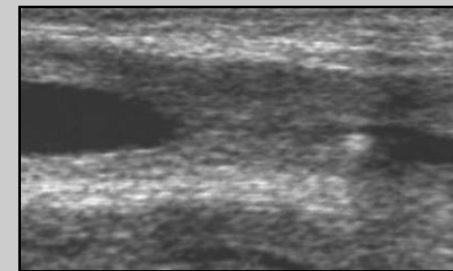
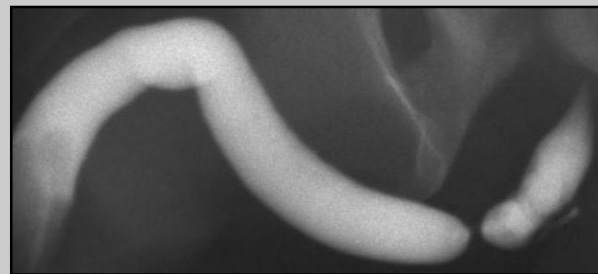
- congenital
- instrumentation
- infection
- unknown

# Success rate of urethrotomy based on stricture etiology

**congenital 66%**

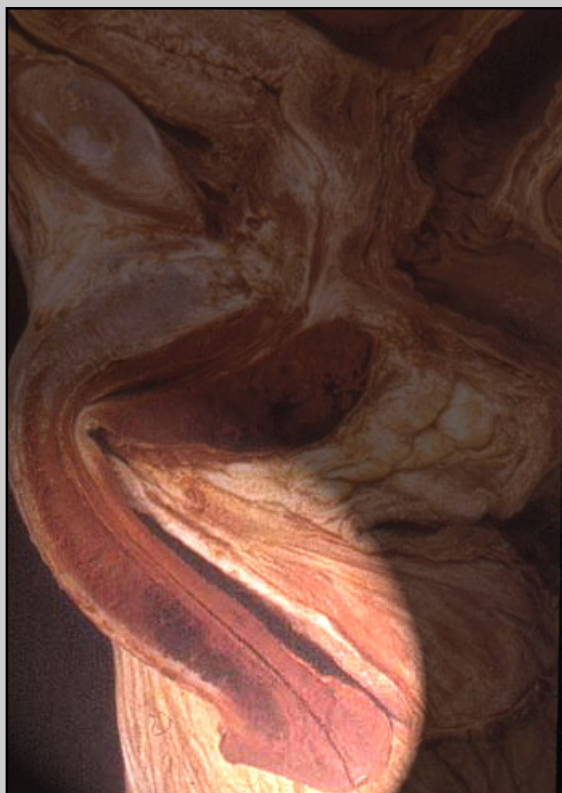


**trauma 16%**



**Pansadoro V. and Emiliozzi P., J Urol 1996, 156: 73-75**

# Success rate of urethrotomy based on stricture site



**penile urethra 16 %**



**bulbar urethra 42 %**

**Pansadoro V. and Emiliozzi P., J Urol 1996, 156: 73-75**

# Success rate of urethrotomy based on stricture length

**stricture < 1 cm**

**71%**

**stricture > 1 cm**

**18%**

**Pansadoro V. and Emiliozzi P., J Urol 1996, 156: 73-75**



# Associated adverse conditions

~~Urethrostomy~~

stent



tumor



stone

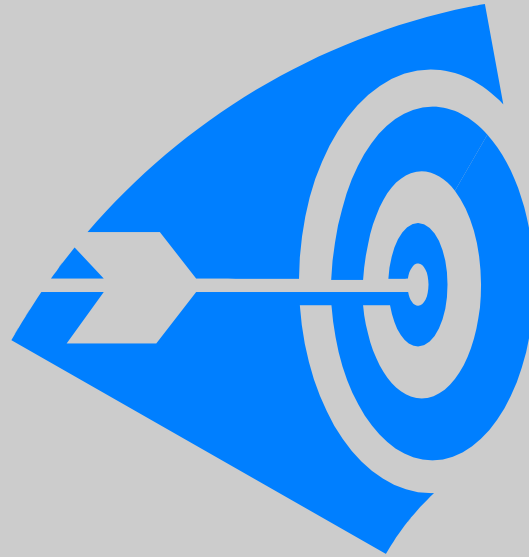


diverticulum

abscess

fistula

# How many times can I repeat urethrotomy ?





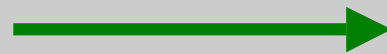
**It depends on how long the patient has been  
disease-free**

**< 1 year**

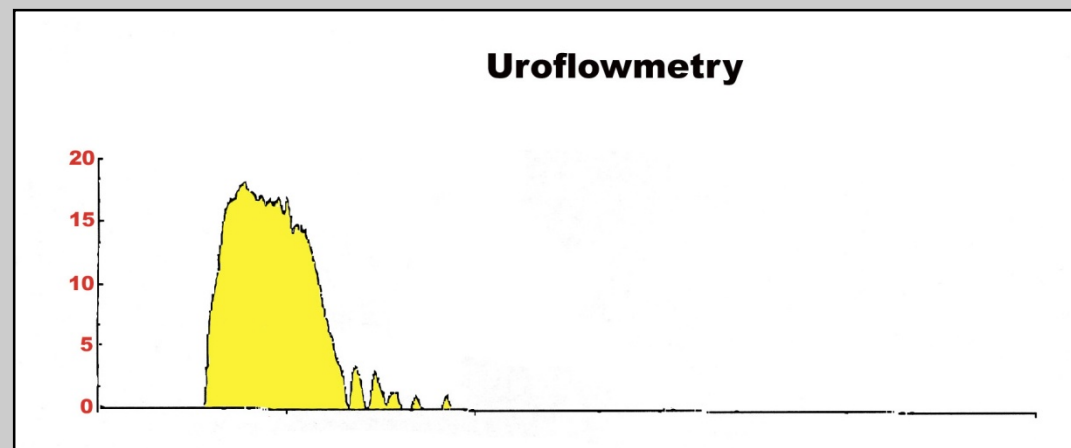


**I can't**

**> 1 year**



**I can**



**Which type of urethroplasty ?**

# Penile urethra



**Basically, the surgical technique for the repair of penile urethral strictures is selected according to**

**stricture etiology**

# **Etiology of penile urethral strictures**

- **Failed hypospadias repair**
- **Lichen sclerosus**
- **Trauma**
- **Instrumentation**
- **Catheter**
- **Infection**
- **Other cause**

## In penile urethral strictures due to:

- Trauma
- Instrumentation
- Catheter
- Infection
- Other cause



**The penis is normal: one-stage repair**

## In penile urethral strictures due to:



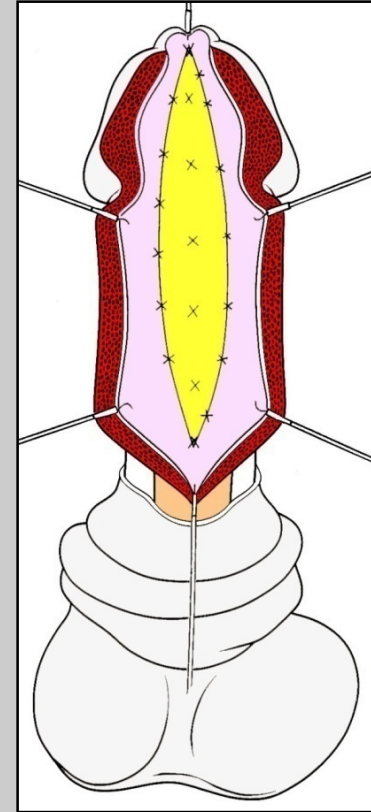
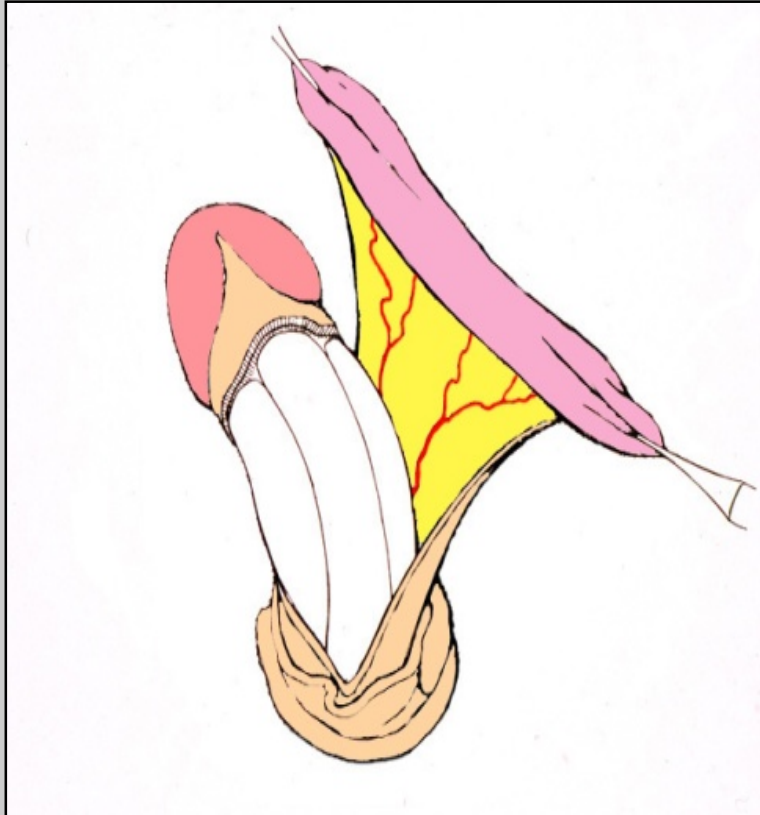
Failed hypospadias repair



Lichen sclerosus

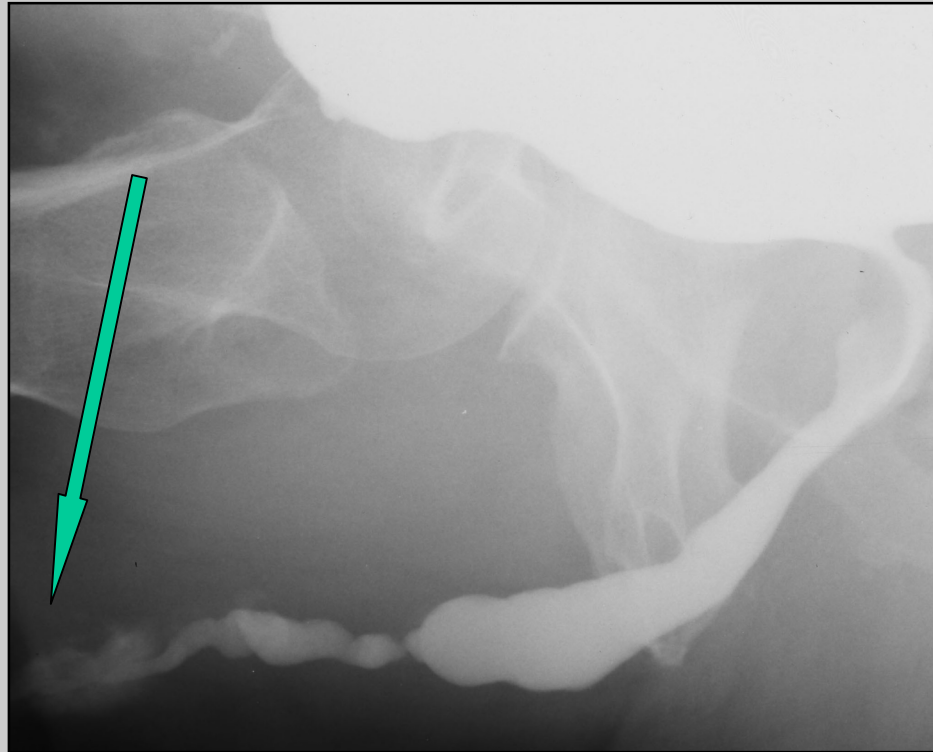
**The penis is abnormal: two-stage repair**

# One-stage penile urethroplasty



**Flap or graft?**

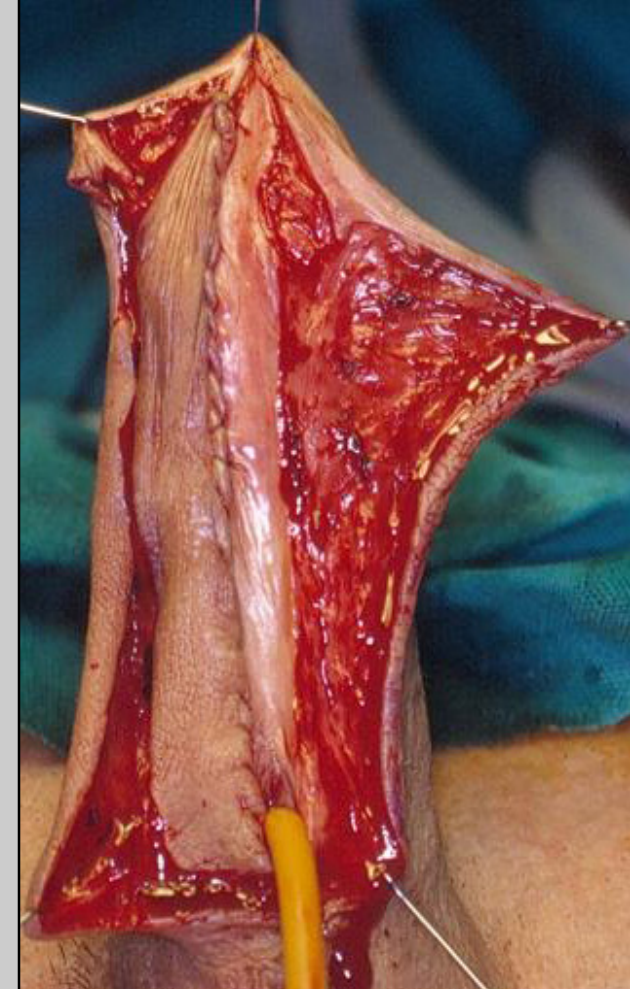


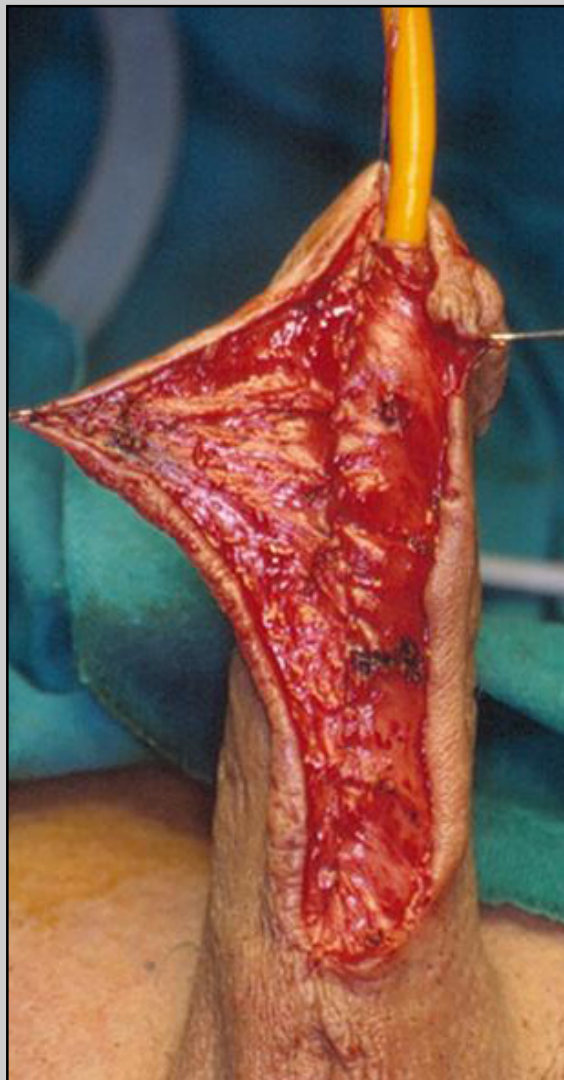
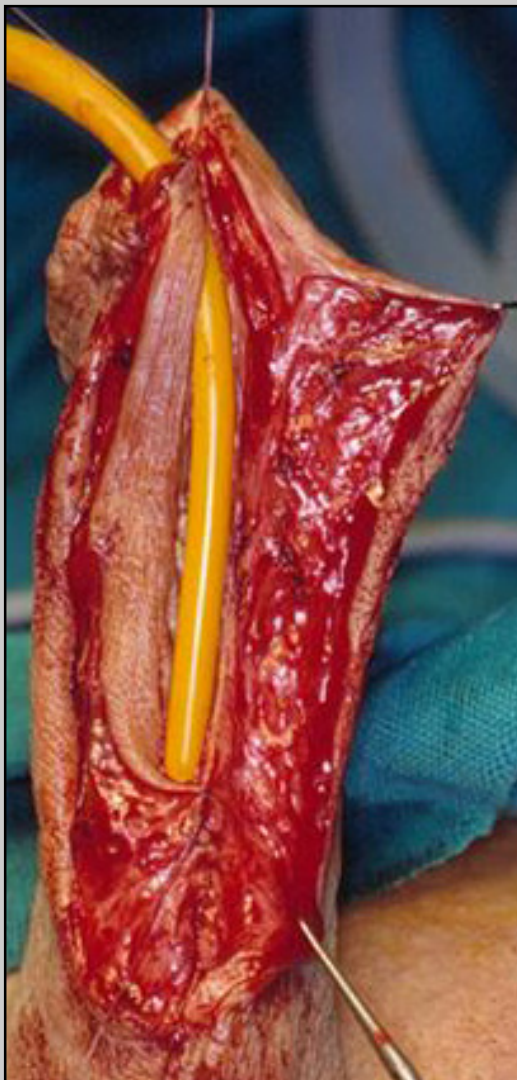


**Penile urethral stricture involving external urinary meatus**

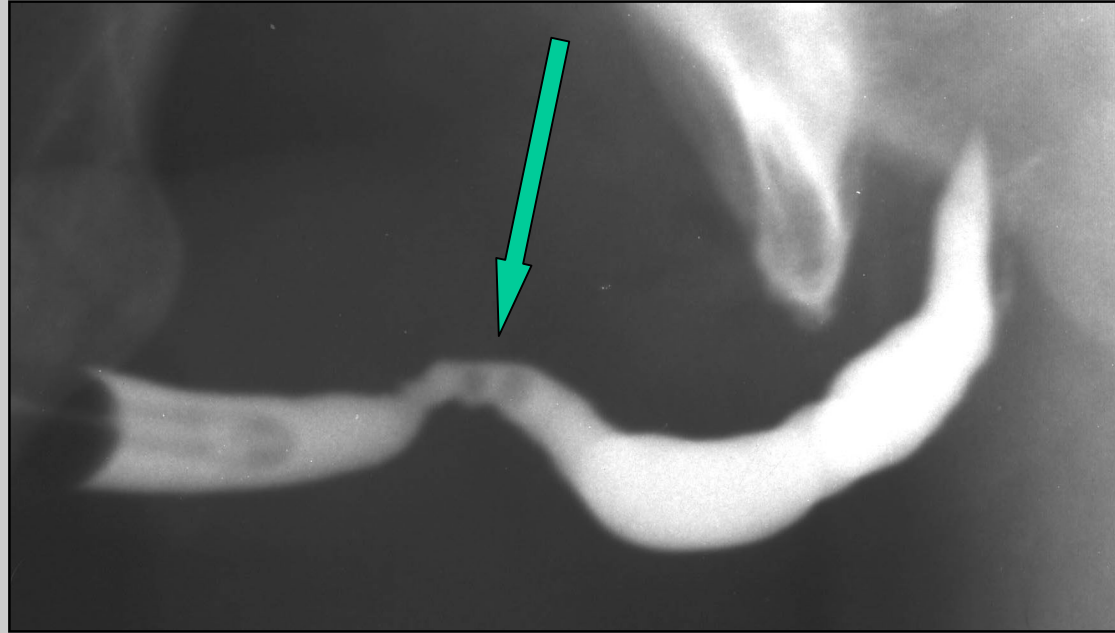


## Jordan's flap



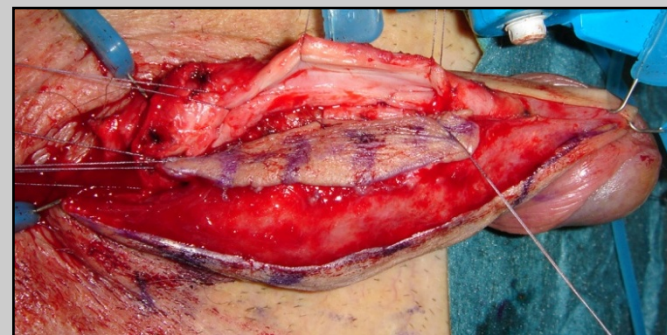
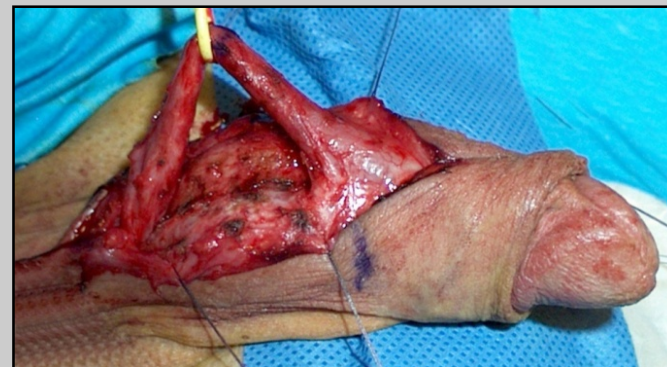




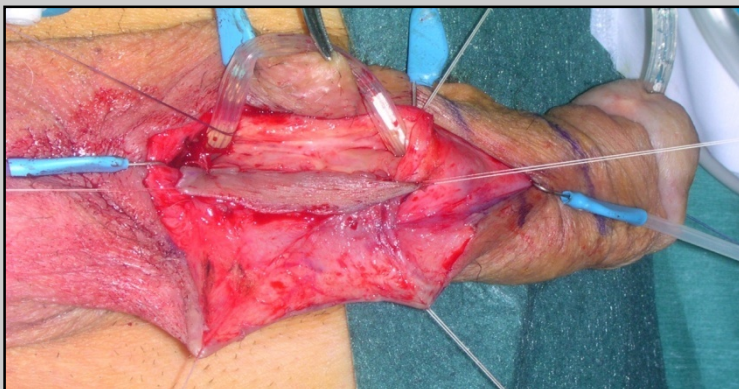


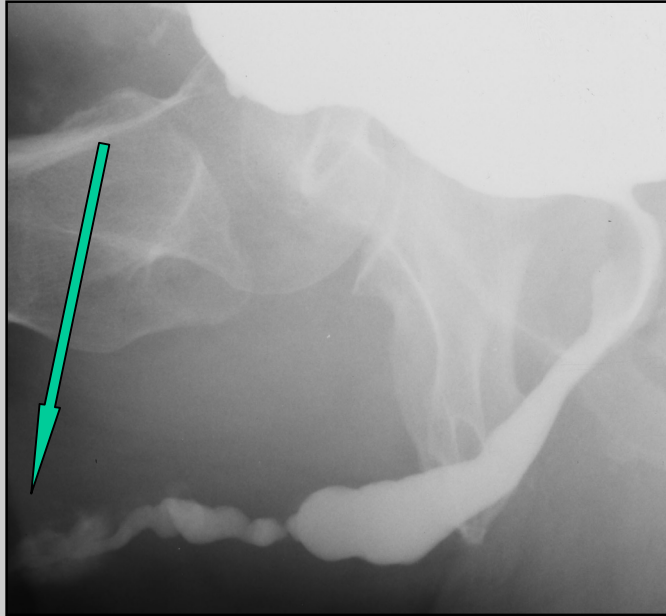
**Penile urethral stricture in the middle tract of the shaft**

# Barbagli's dorsal flap





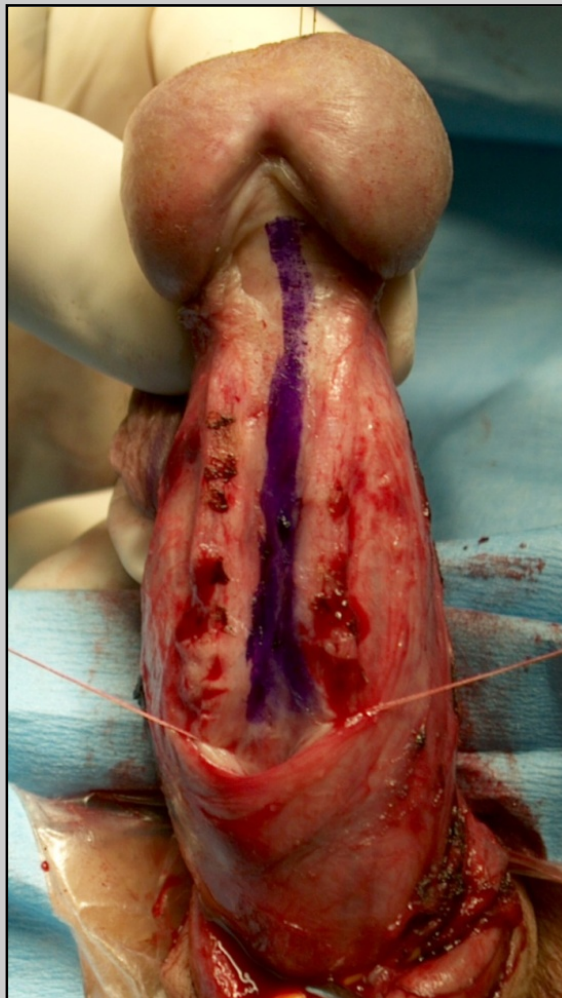




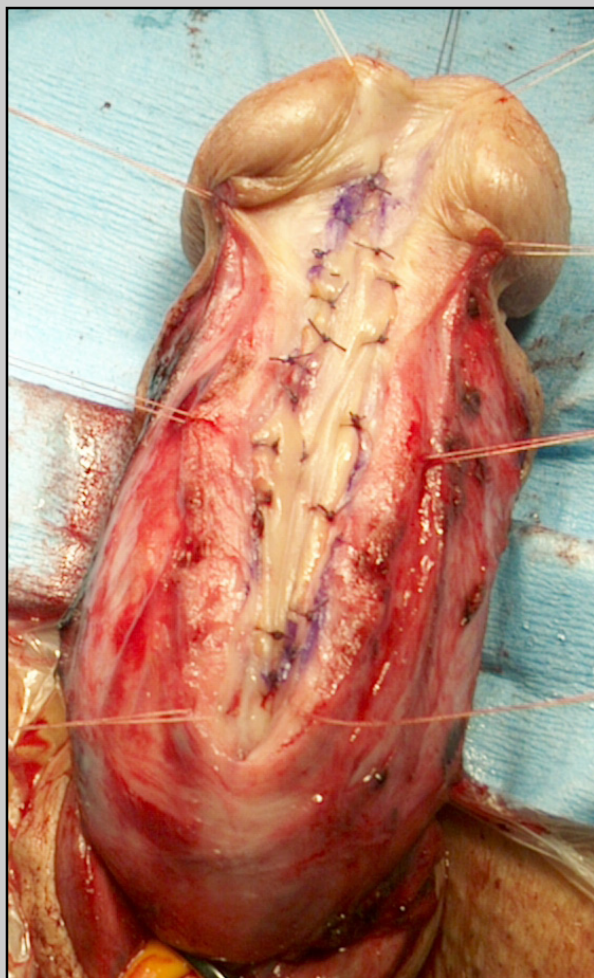
**Penile urethral stricture involving external urinary meatus or in the middle tract of the shaft**



## Asopa's graft







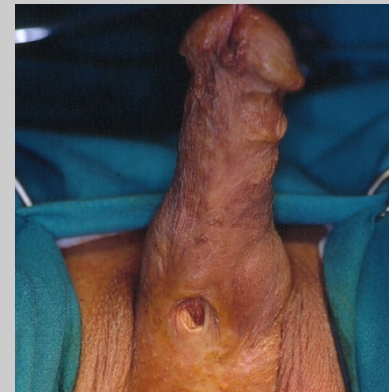
# Complications following one-stage flap or graft penile urethroplasty



**penile hematoma**



**skin necrosis**



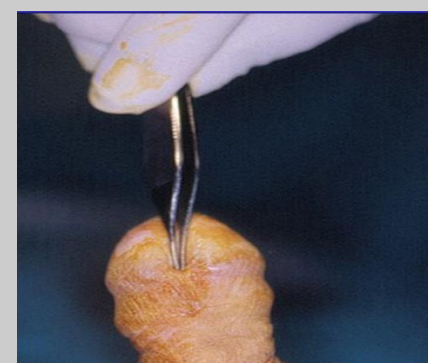
**fistula**



**penile-glans torsion**



**sacculation**



**meatal stenosis**

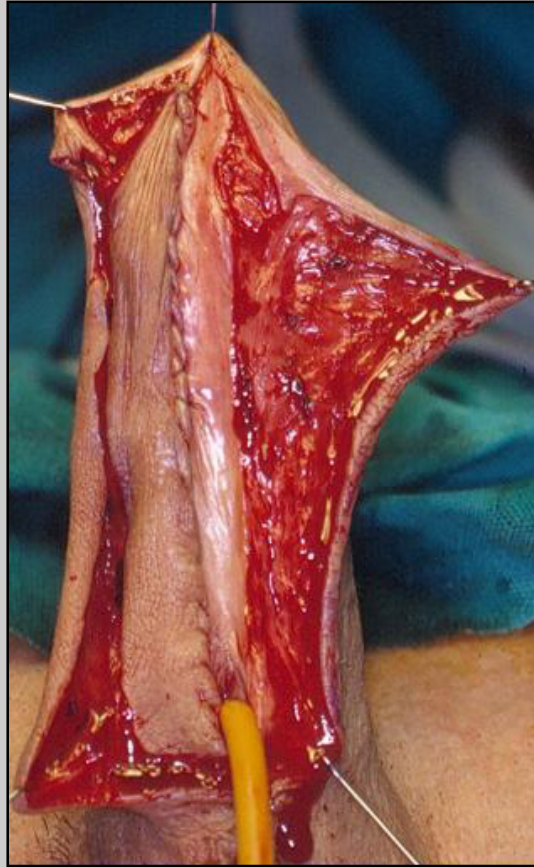


# One-stage penile flap or graft urethroplasty

## Results

patients	type of repair	success
18	flap	66.7%
22	oral graft	81.8%
23	skin graft	78.3%

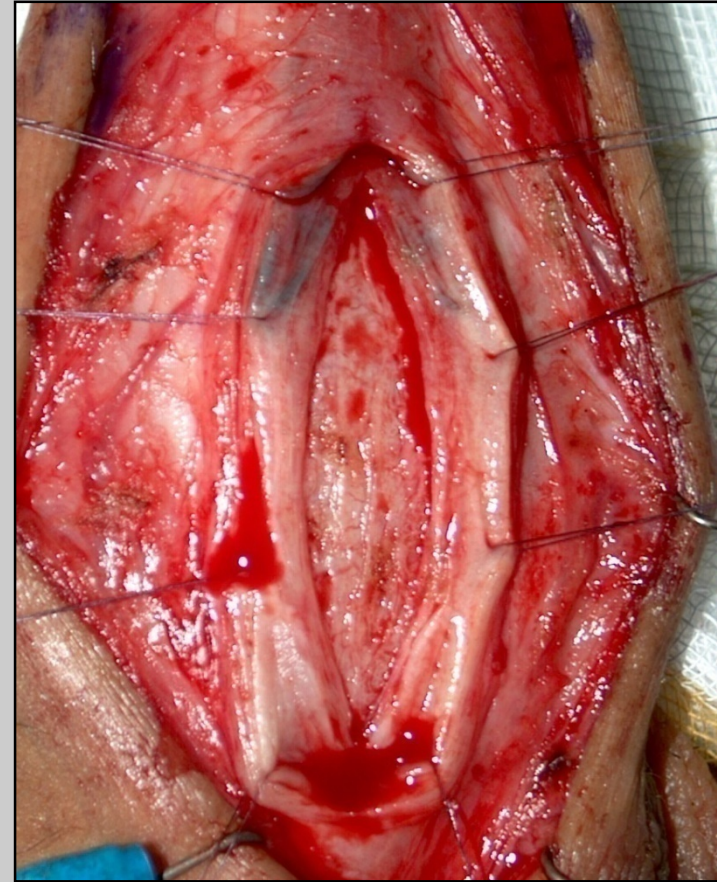
Barbagli G. et al, BJU Int 2008



flap

?

graft



**The choice between flap or graft urethroplasty is made according to the urethral plate and to the surgeon's background and preference**

# Two-stage urethroplasty using oral mucosal graft



**Penile urethral stricture in patient with failed hypospadias repair  
or lichen sclerosus**



## First stage



# Complications following the first stage of urethroplasty



**10-39% of patients showed scarring of the initial graft, requiring new grafting procedures**

**Barbagli et al., Eur Urol, 2006**



## Second stage

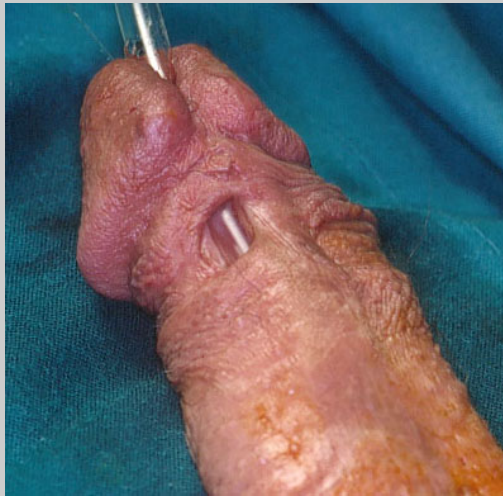


## Second stage





# Complications following the second stage of urethroplasty



**fistula**



**glans dehiscence**



**meatal stenosis**

**30% of patients showed complications following the second stage of urethroplasty, requiring surgical revision**

**Barbagli et al., Eur Urol, 2006**



**Two-stage penile urethroplasty using oral graft is not a simple procedure and requires great expertise to avoid a lot of traps**

**Moreover, this two-stage procedure, also in the hands of the skilled surgeon, showed a high complication rate, either following the first stage or the second stage**

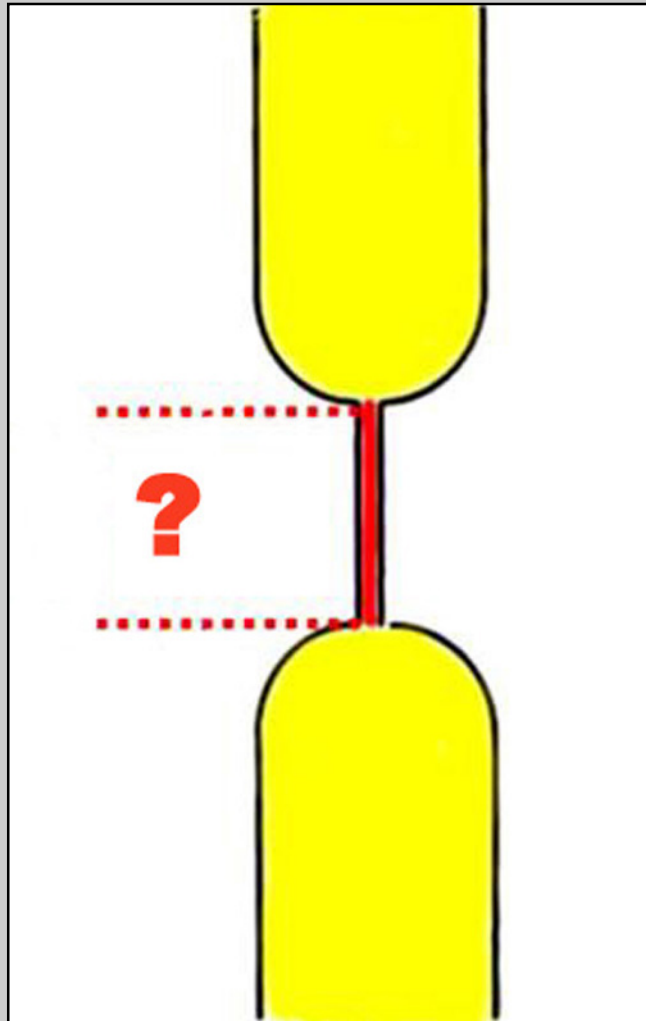
## Bulbar urethra



**Basically, the surgical technique for the repair of bulbar urethral strictures is selected according to the**

**stricture length**

# Which type of bulbar urethroplasty ?



**1 - 2 cm:** end-to-end anastomosis

**2 – 4 cm:** augmented anastomotic repair

**> 4 cm:** substitution urethroplasty

stricture associated with local adverse  
conditions: **two-stage urethroplasty**

# Preparation of the patient



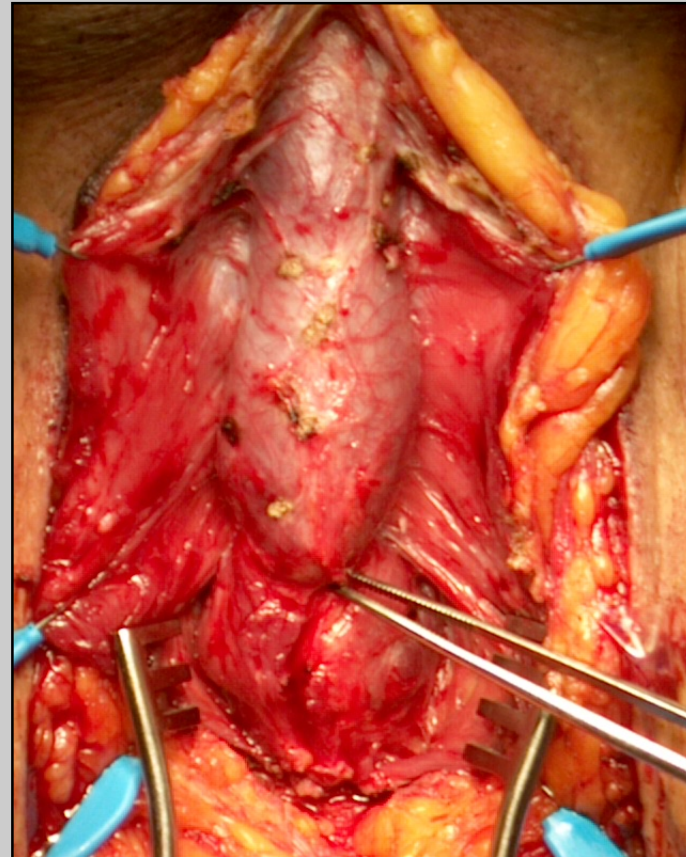
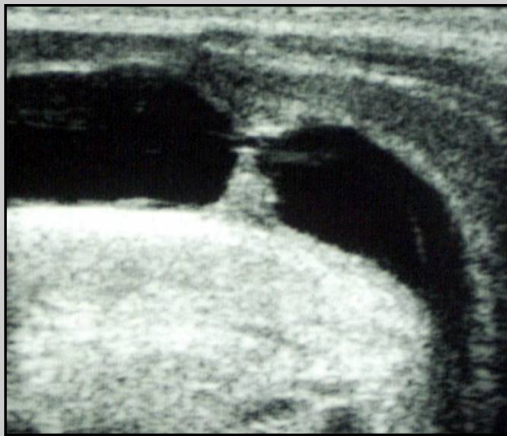
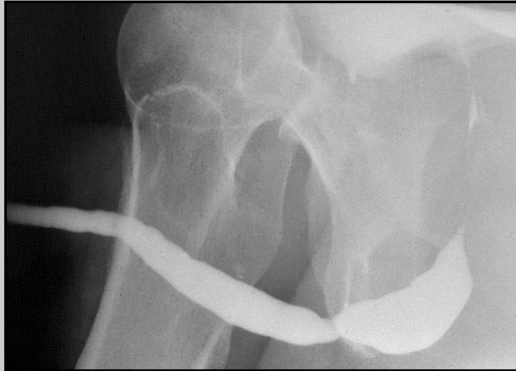
**Simple lithotomy position**



**Allen stirrups with sequential inflatable compression sleeves**

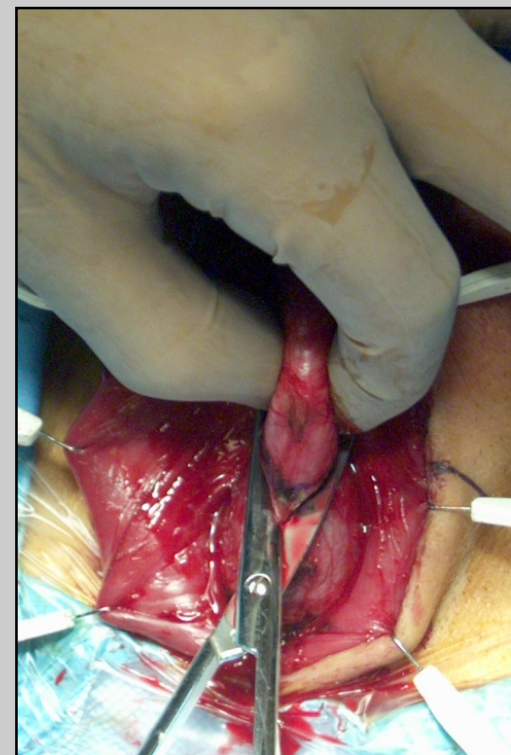
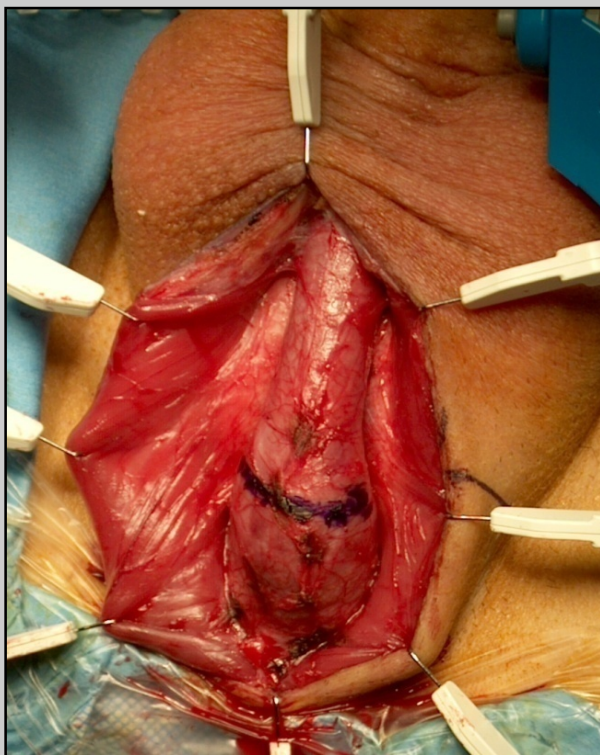
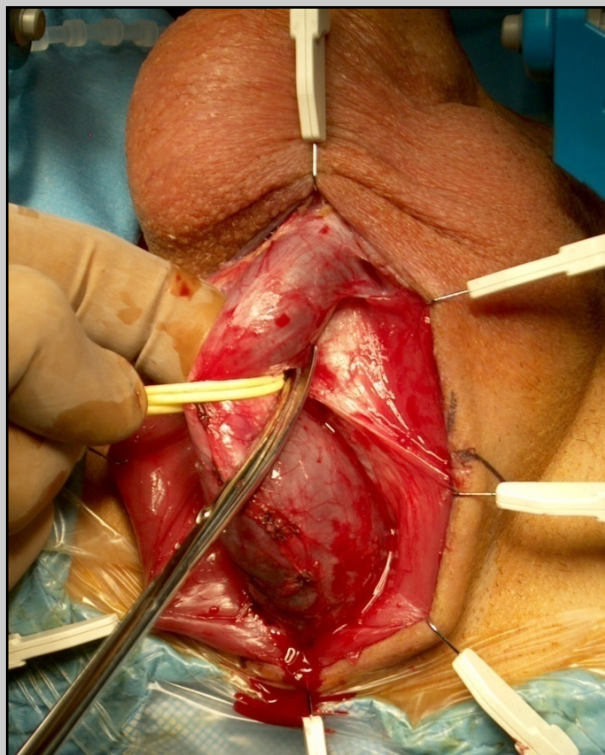


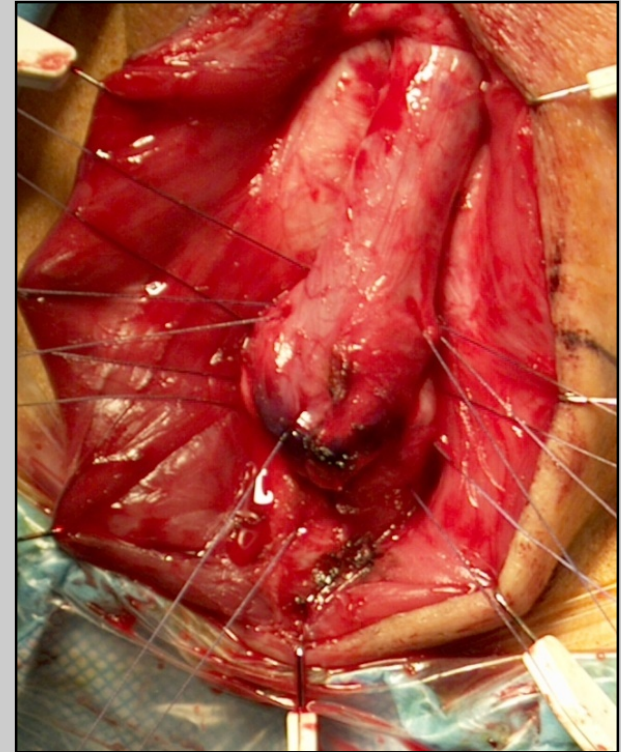
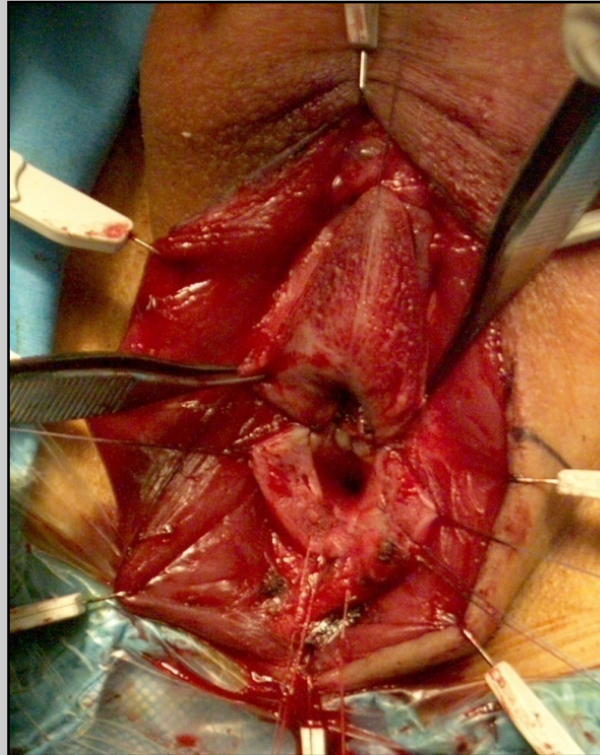
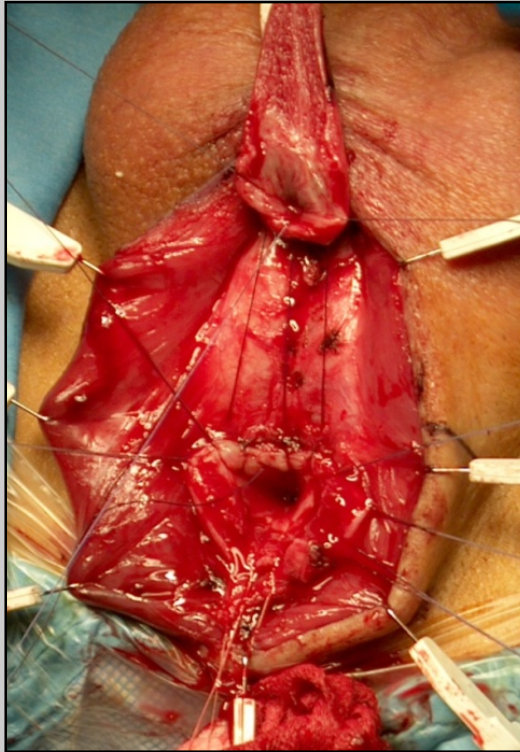
## 1 - 2 cm bulbar urethral stricture



## End-to-end anastomosis



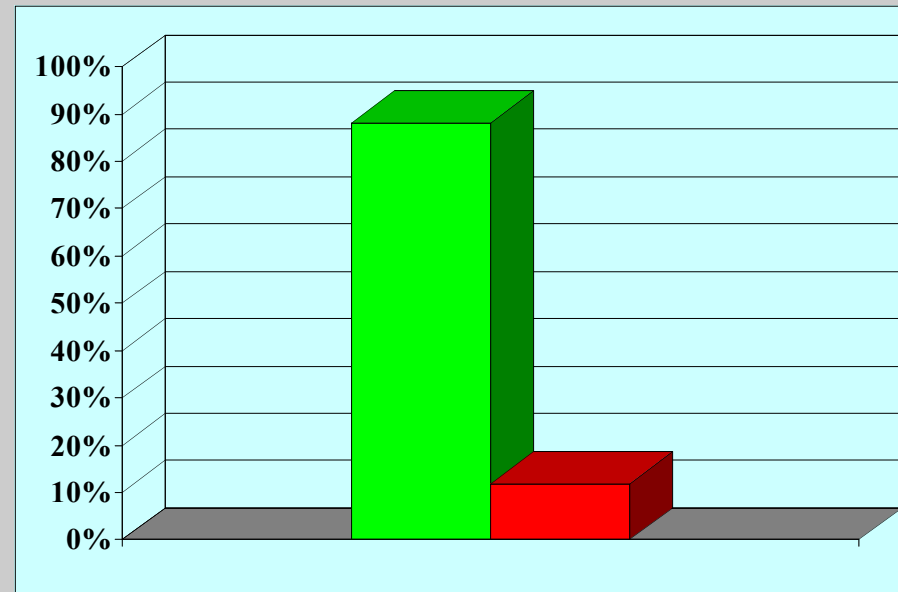






# Results on 176 patients who underwent end-to-end anastomosis

Mean follow-up 75 months (12 – 273 months)



■ success	155 (88.1%)
■ failure	21 (11.9%)

## **2 - 4 cm bulbar urethral stricture**



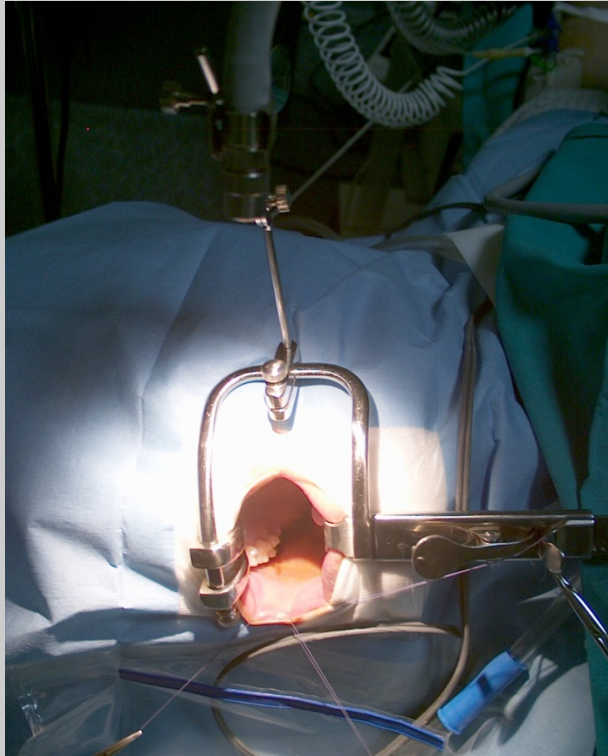
**Augmented anastomotic repair using oral graft**

## Two surgical teams work simultaneously



## Two sets of surgical instruments





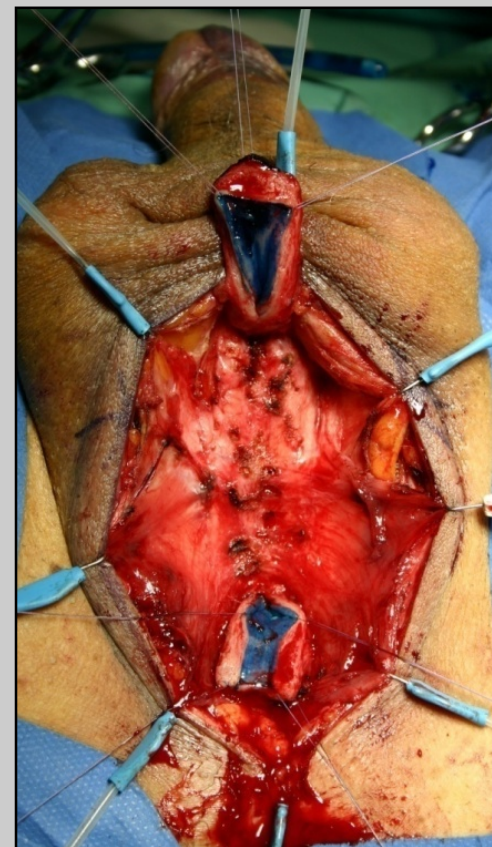
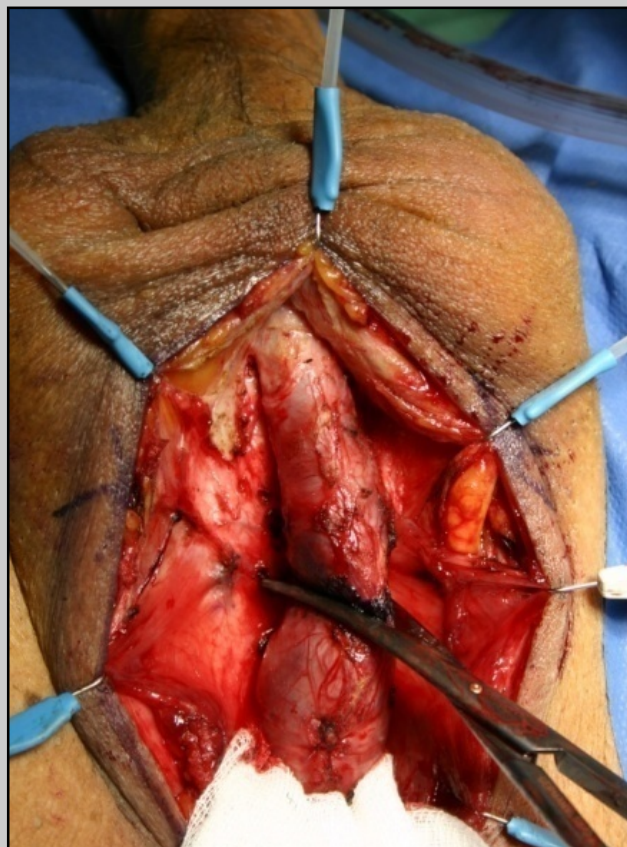
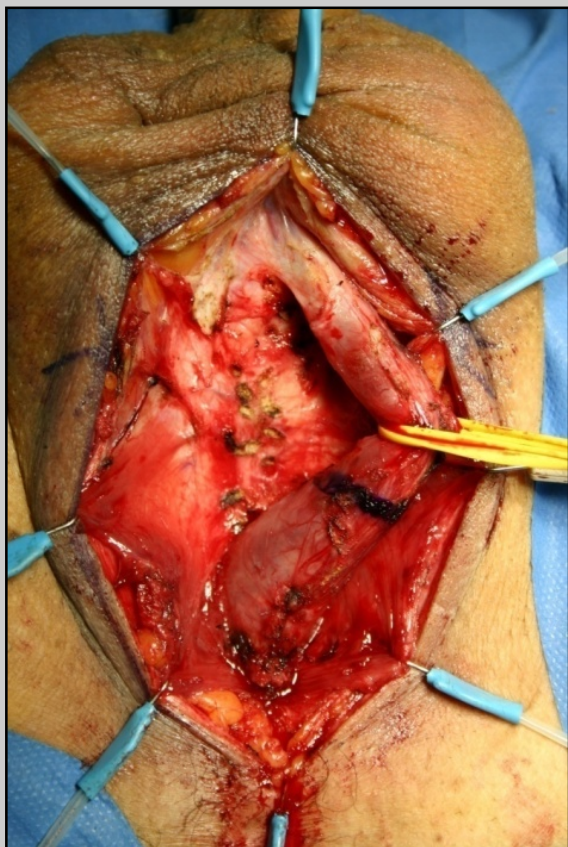
**Appropriate mouth  
retractor**



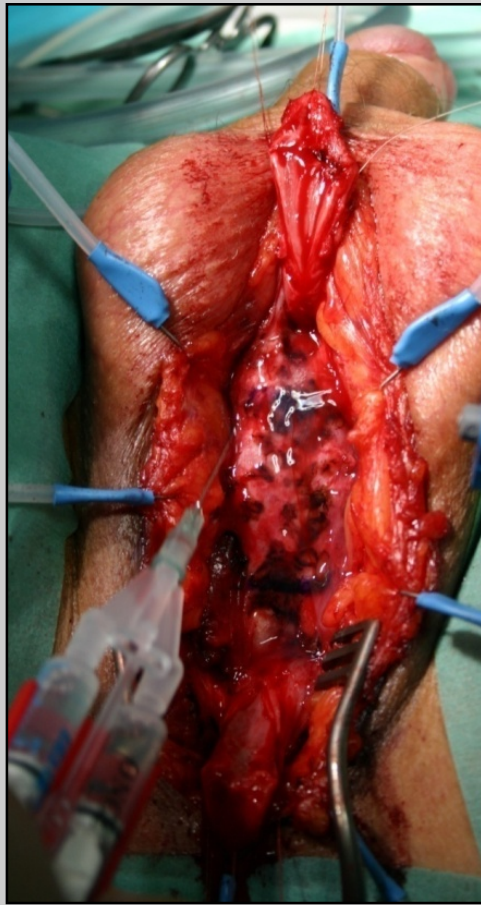
**Only one assistant is needed  
to harvest the oral graft**



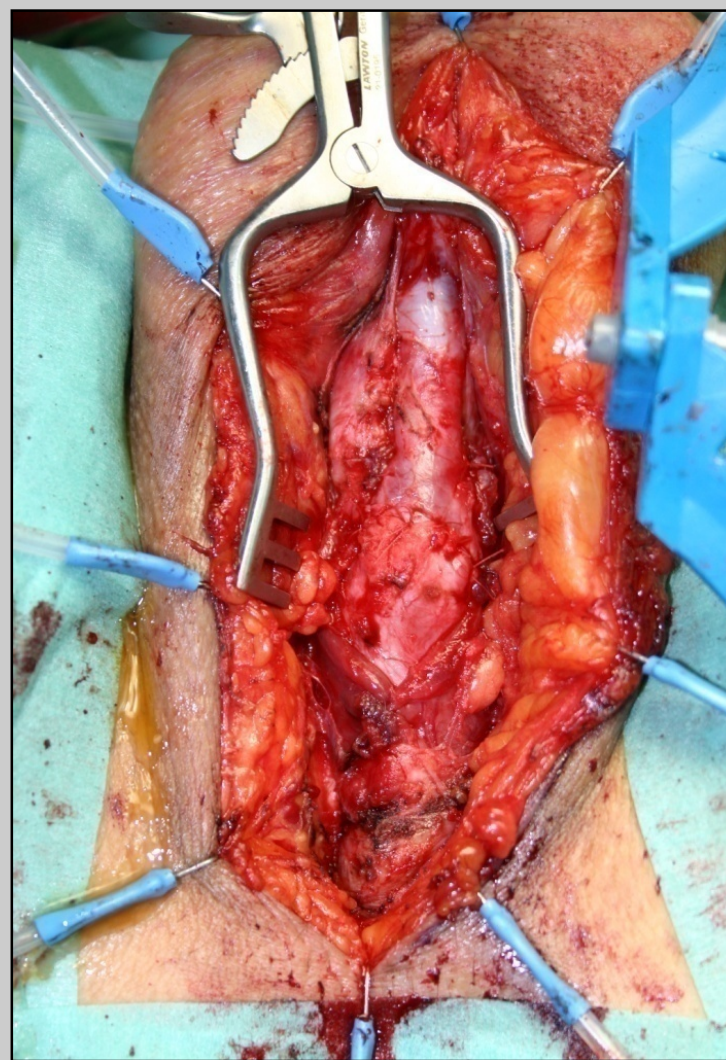
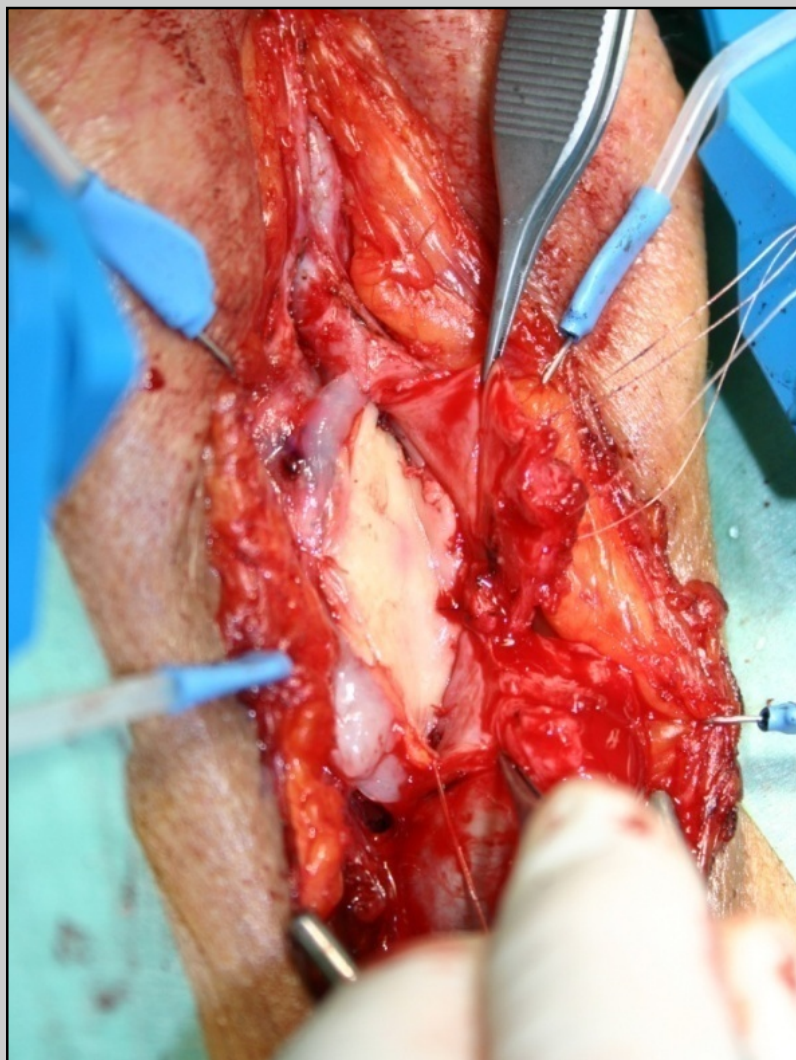






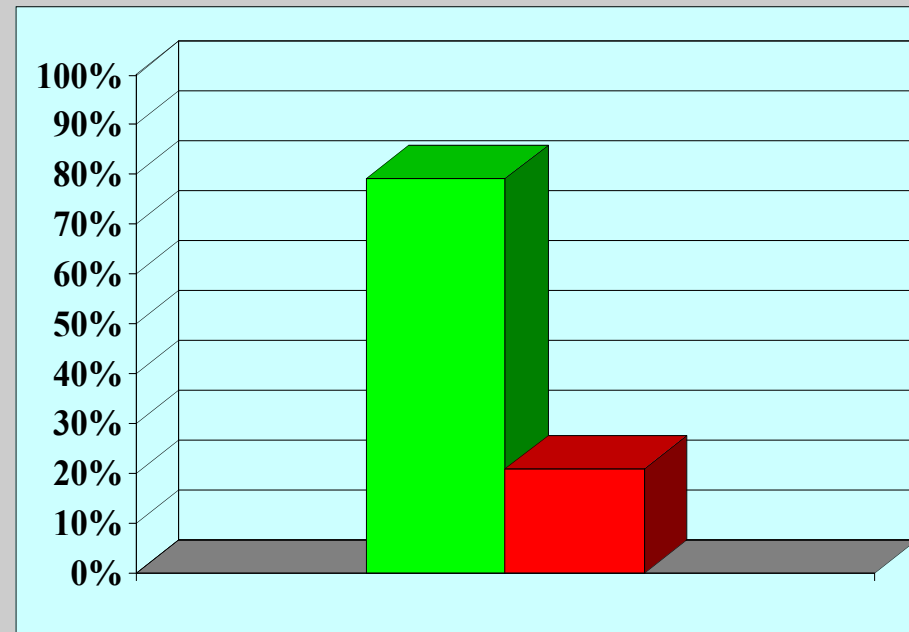






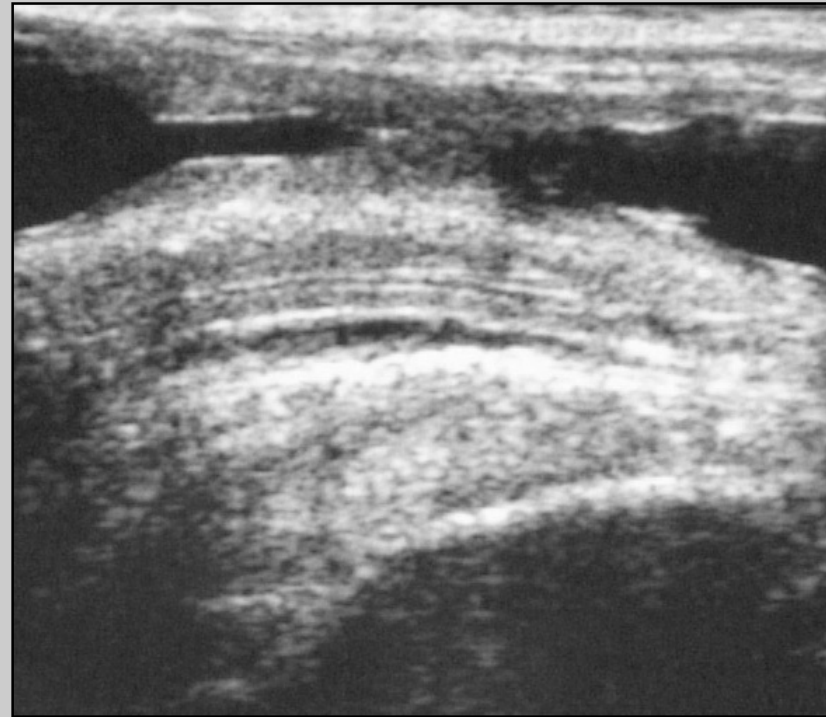
# Results on 24 patients who underwent augmented anastomotic repair using dorsal oral mucosal graft

Mean follow-up 48 months (25 – 78 months)



■ success	19 (79.2%)
■ failure	5 (20.8%)

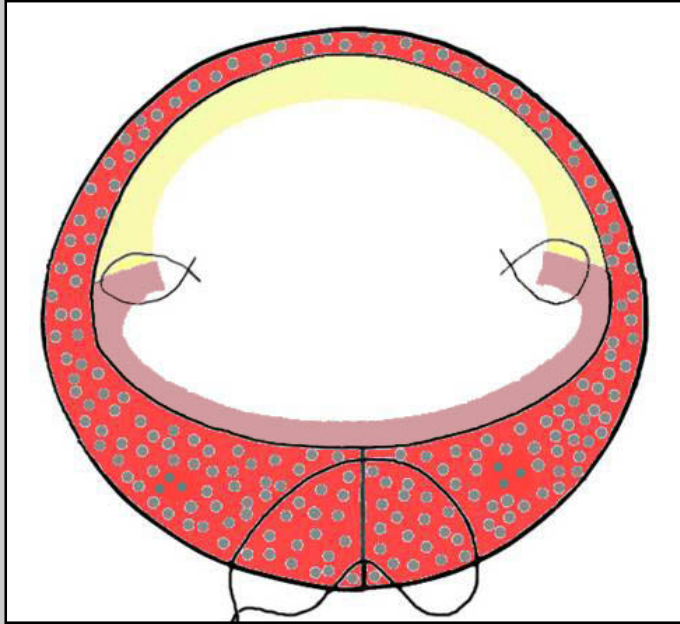
## **> 4 cm bulbar urethral stricture**



## **Substitution urethroplasty**

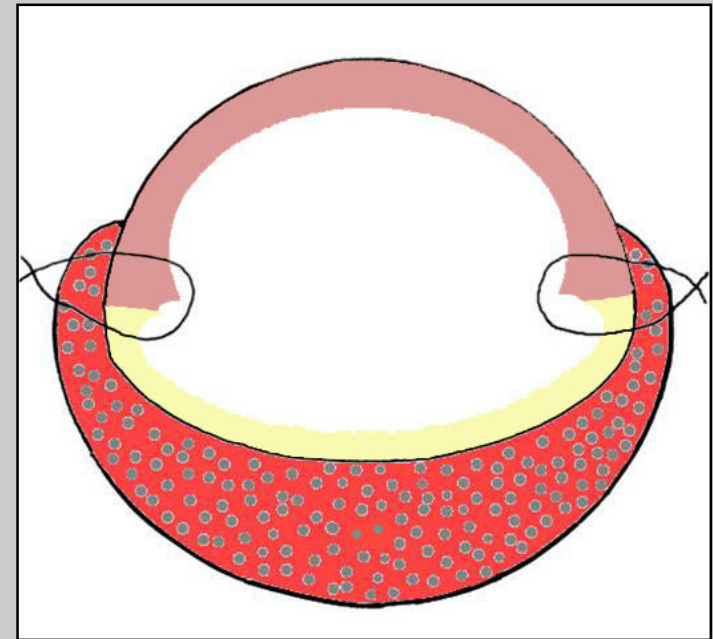


# Substitution urethroplasty



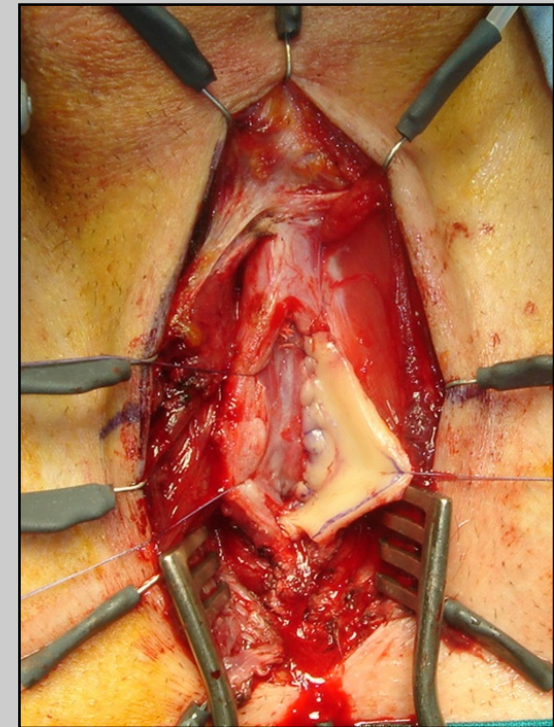
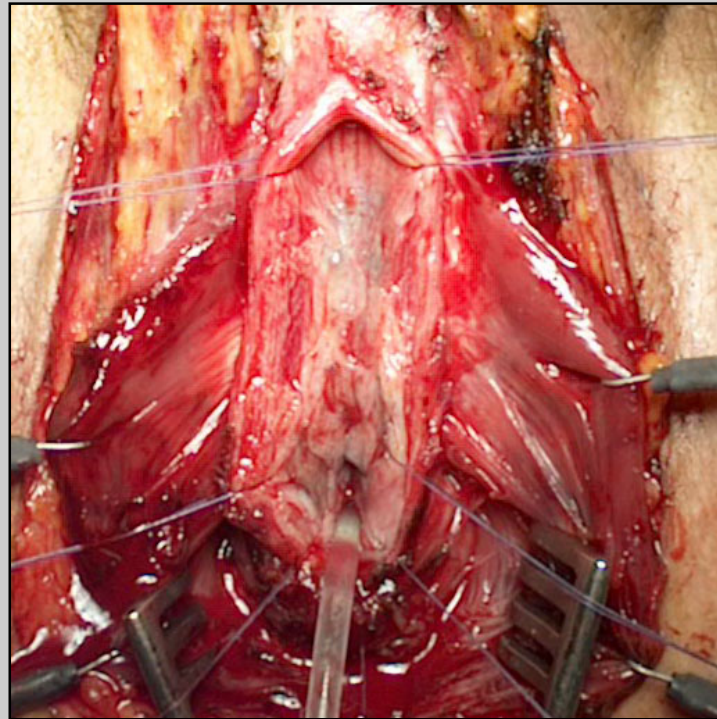
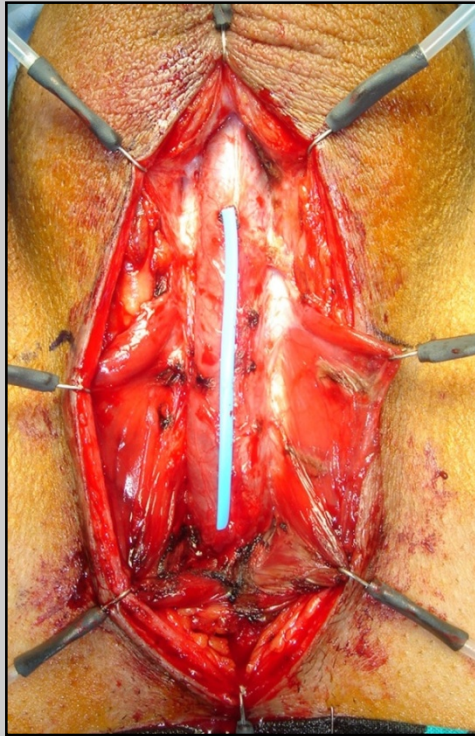
ventral

?

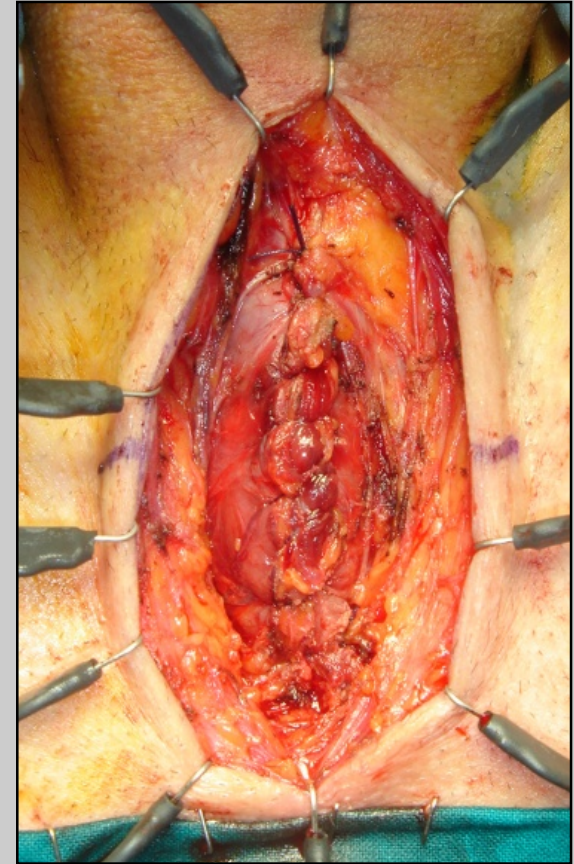
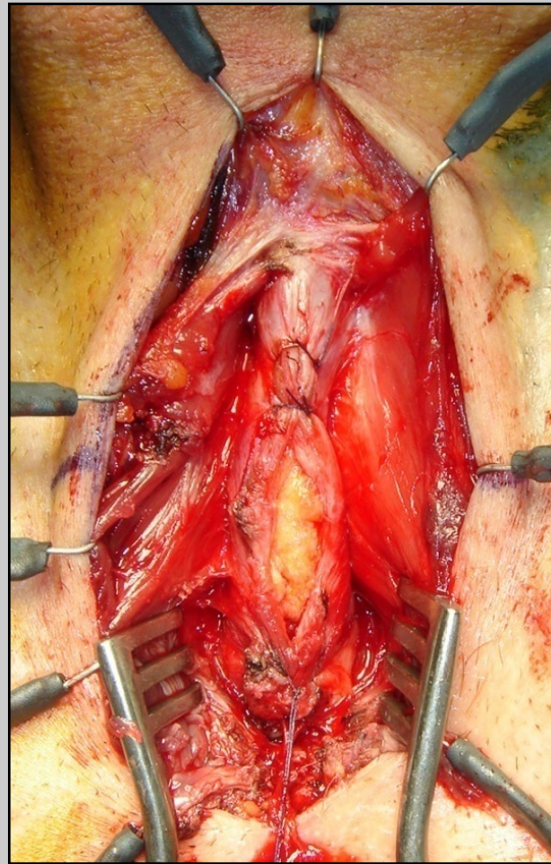
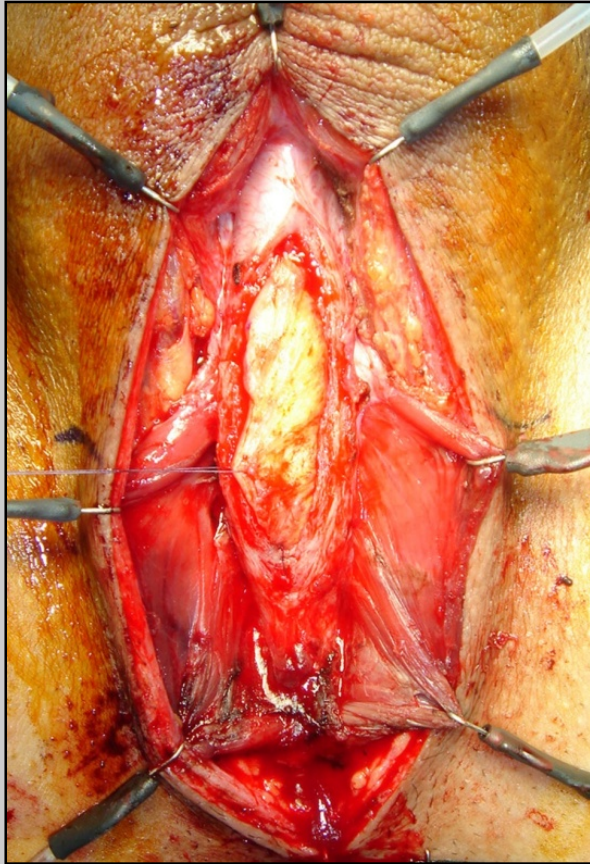


dorsal

# Ventral onlay graft urethroplasty



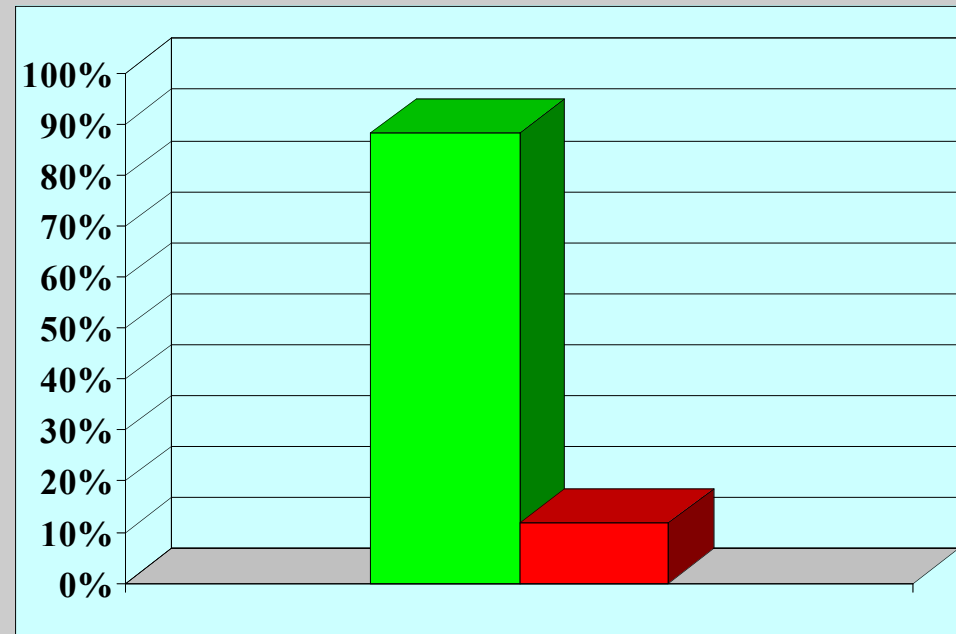






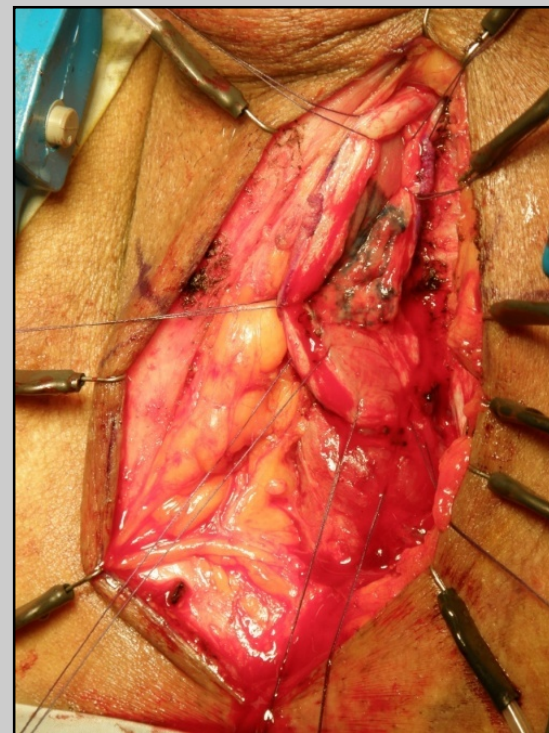
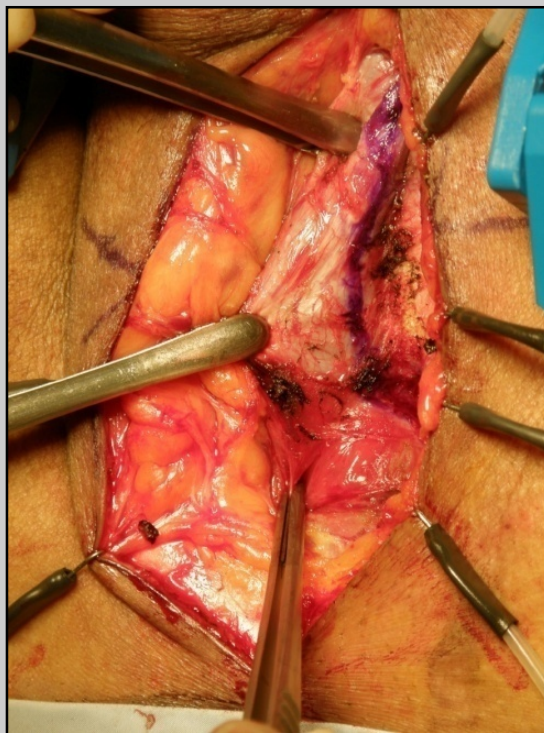
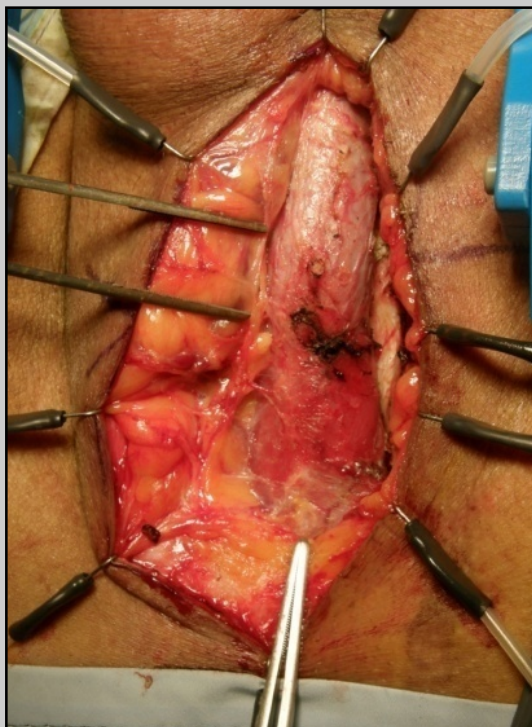
# Results on 143 patients who underwent ventral oral mucosal onlay graft urethroplasty

Mean follow-up 38 months (12-103 months)

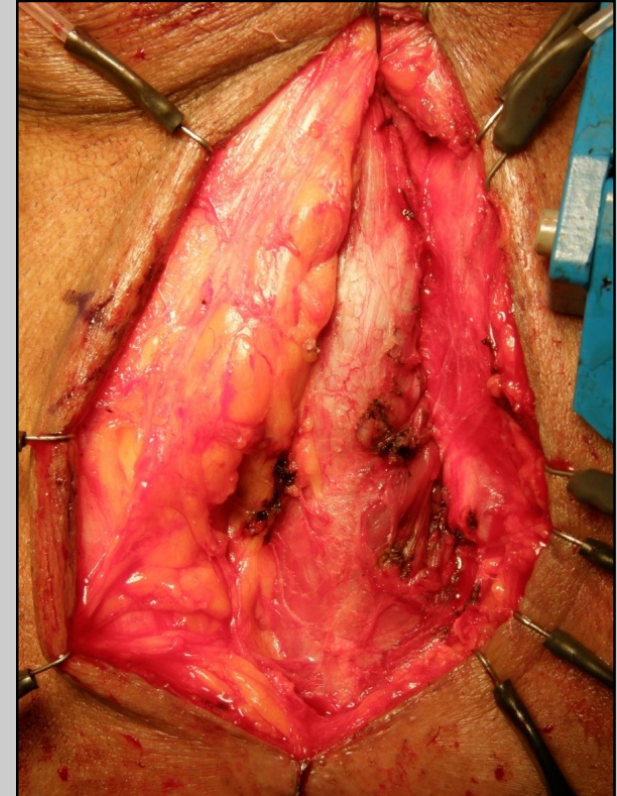
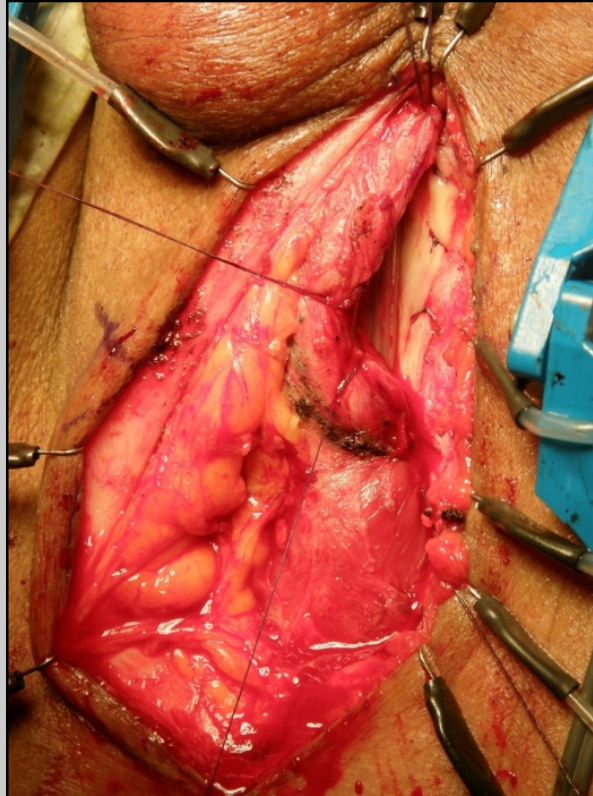
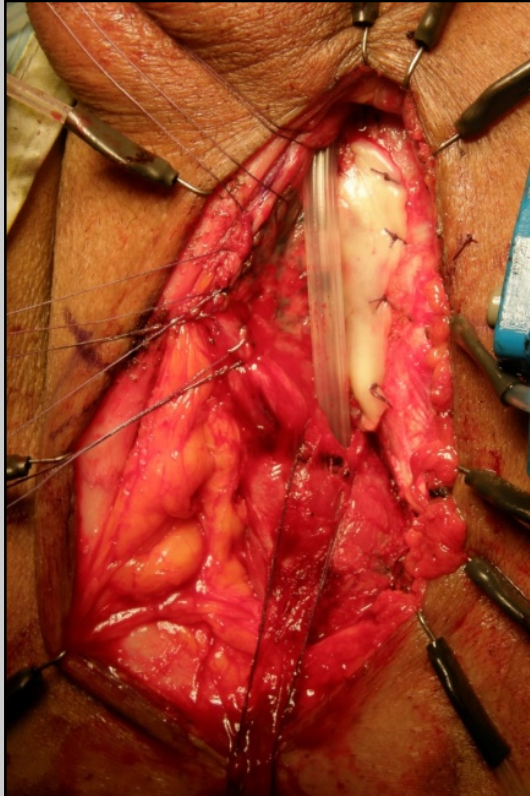


■ success	126 (88.1%)
■ failure	17 (11.9%)

# Dorsal onlay graft urethroplasty



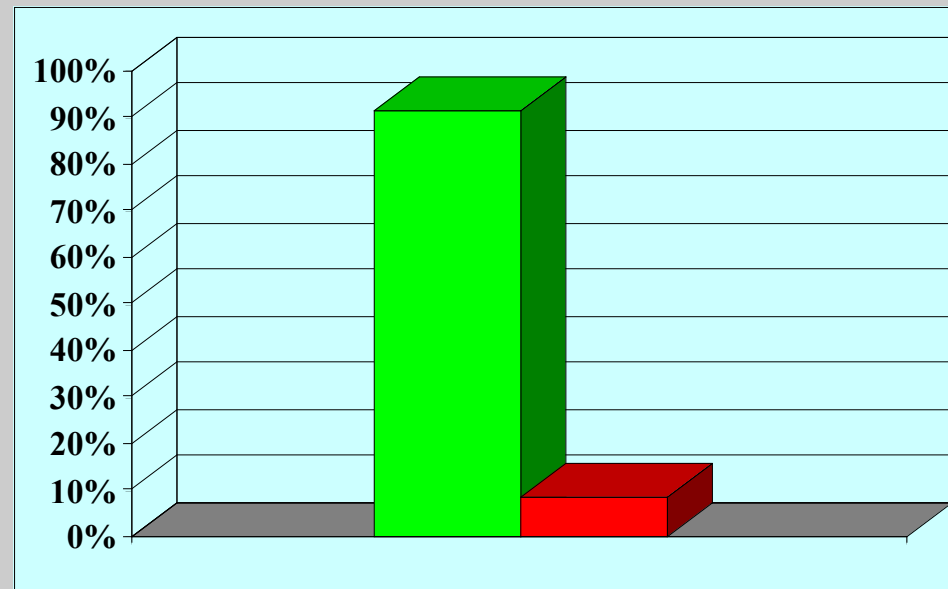






# Results on 24 patients who underwent one-sided anterior urethroplasty

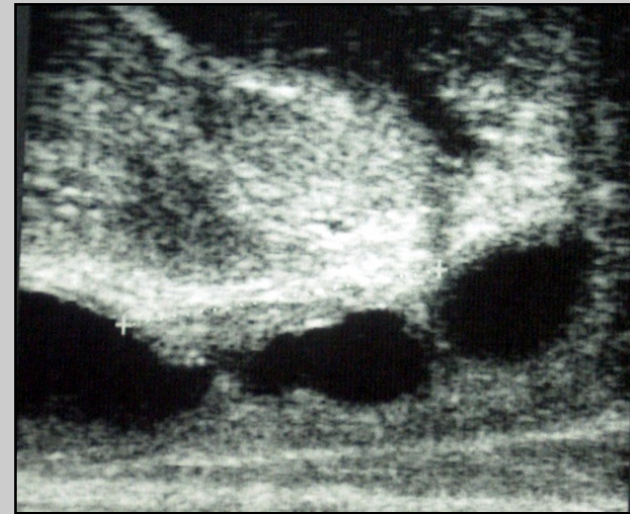
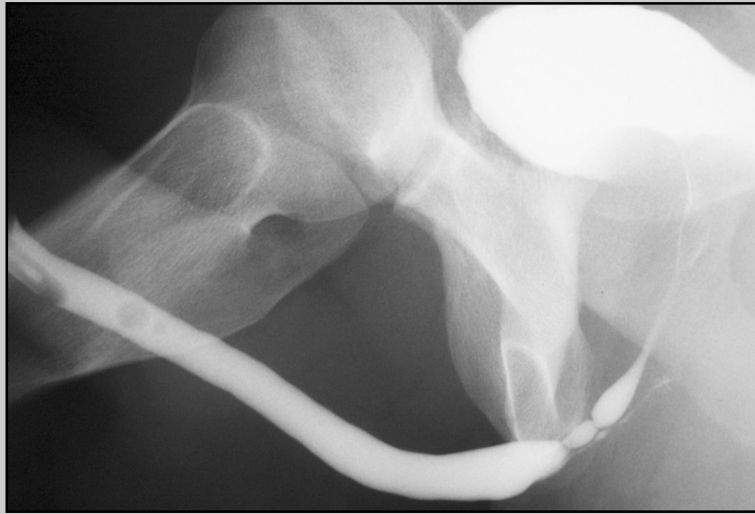
Mean follow-up 22 months (12 – 55 months)



■ success	22 (91.6%)
■ failure	2 (8.4%)

BJU Int, 2009, in press

## Ventral onlay graft



**No-traumatic uncomplicated proximal bulbar urethral strictures**

**3-4 cm in length with limited spongiositis**

## **Dorsal onlay graft**



**No-traumatic long distal bulbar urethral strictures**

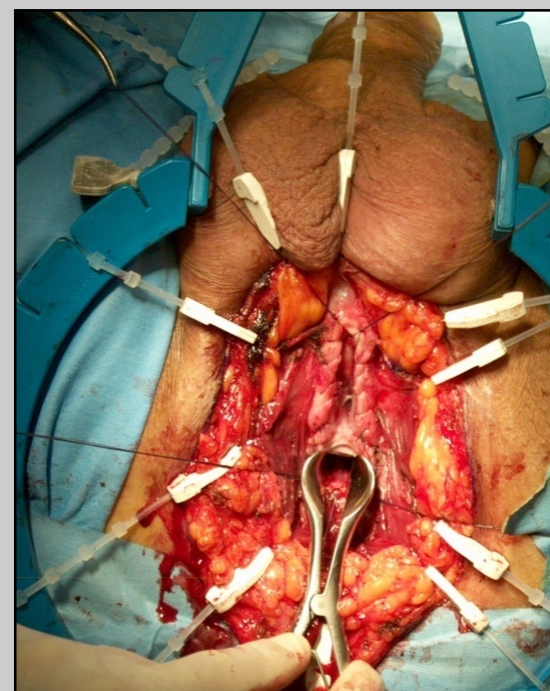
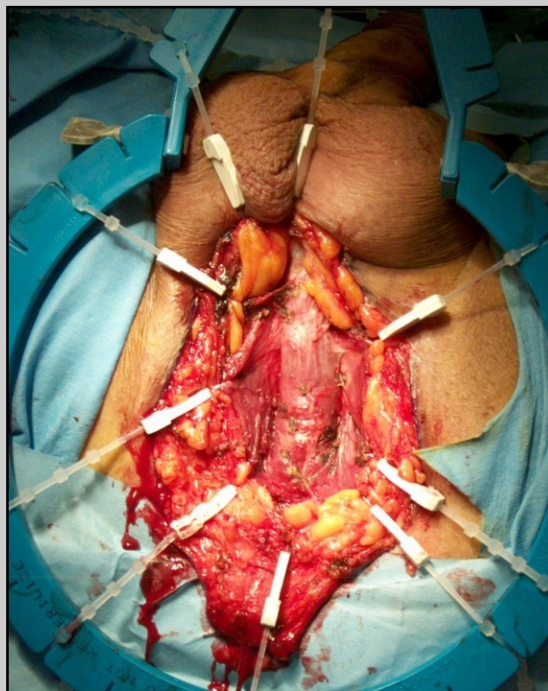


# Bulbar urethral stricture associated with local adverse conditions



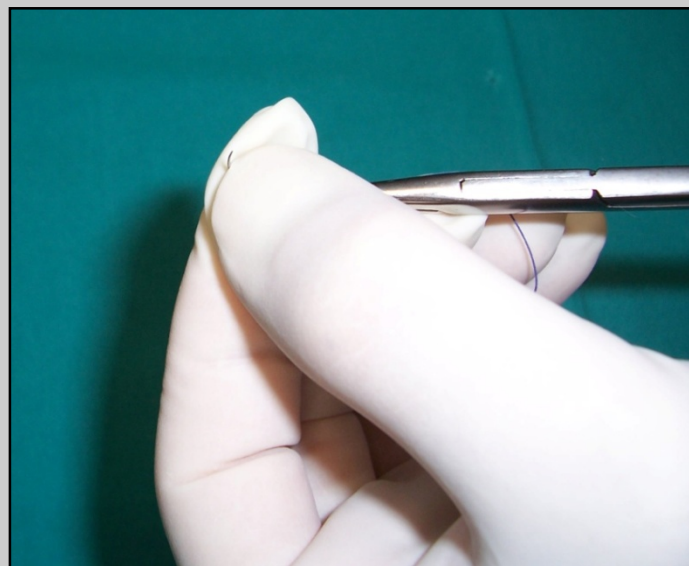
## Two-stage urethroplasty

## First stage



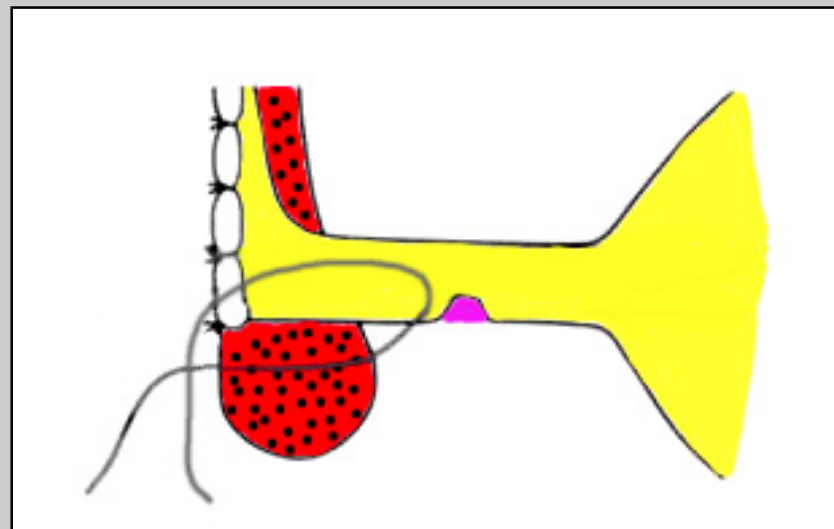
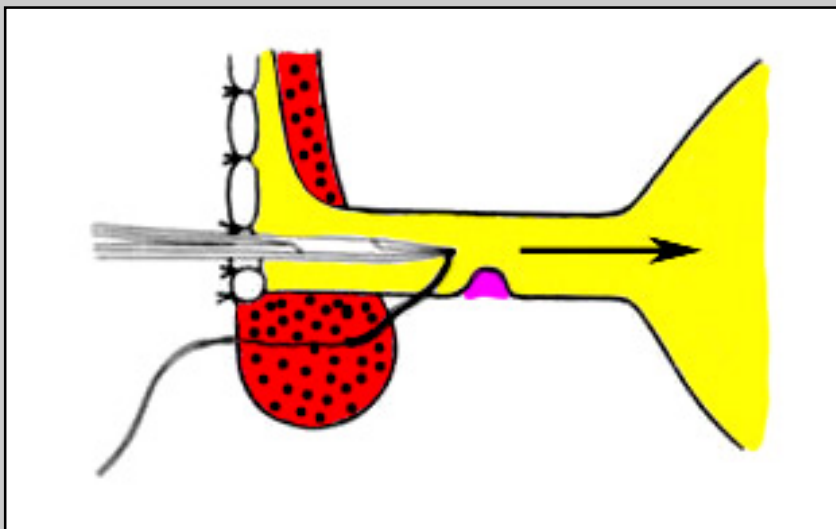
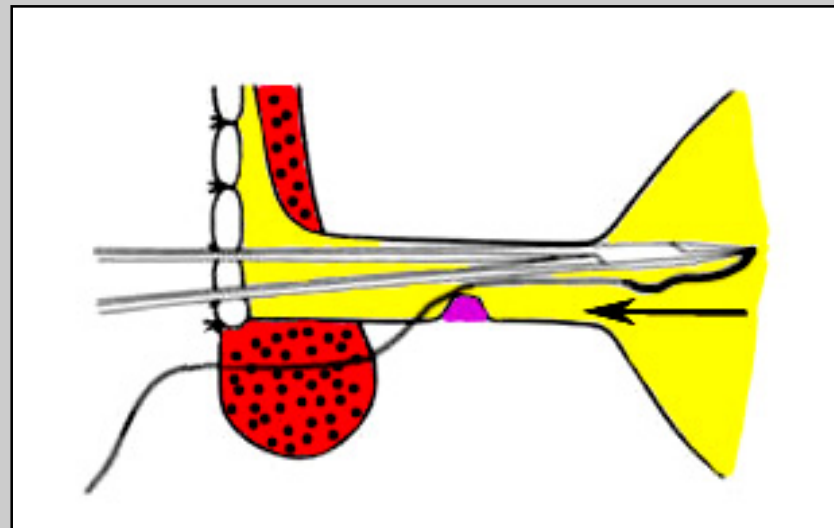
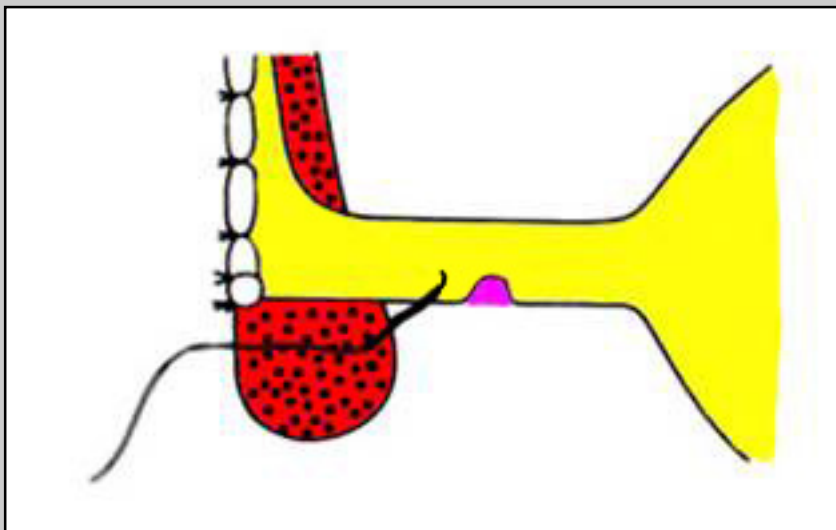


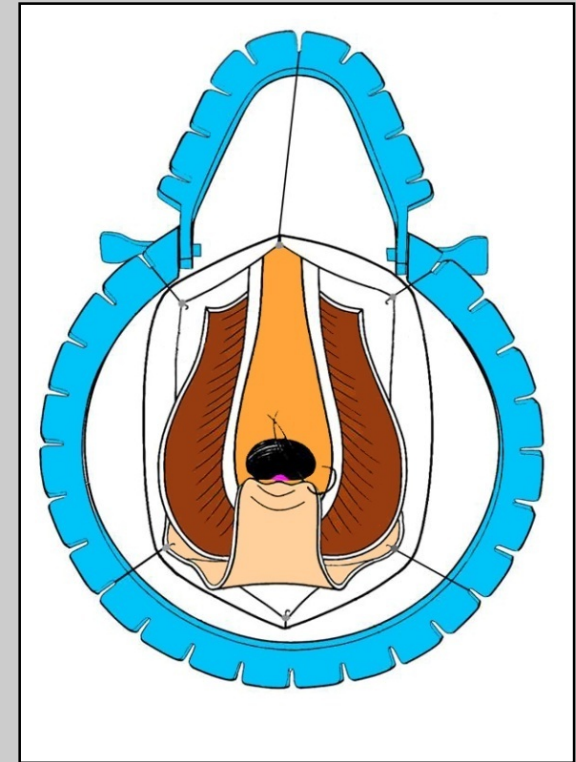
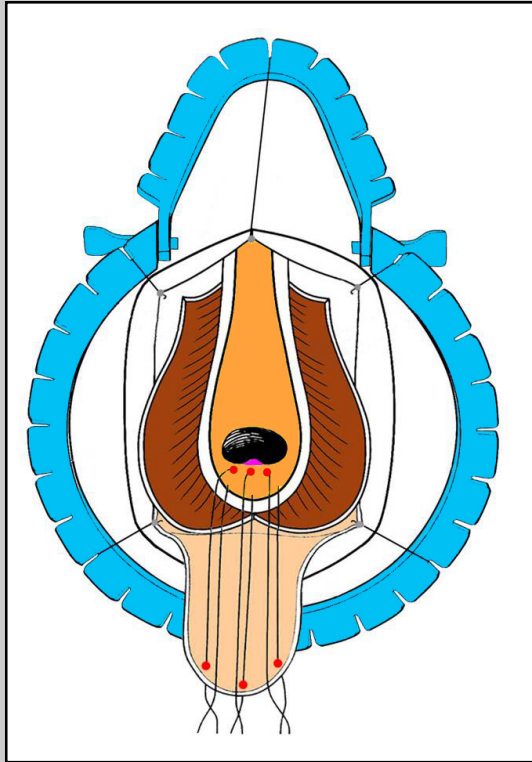
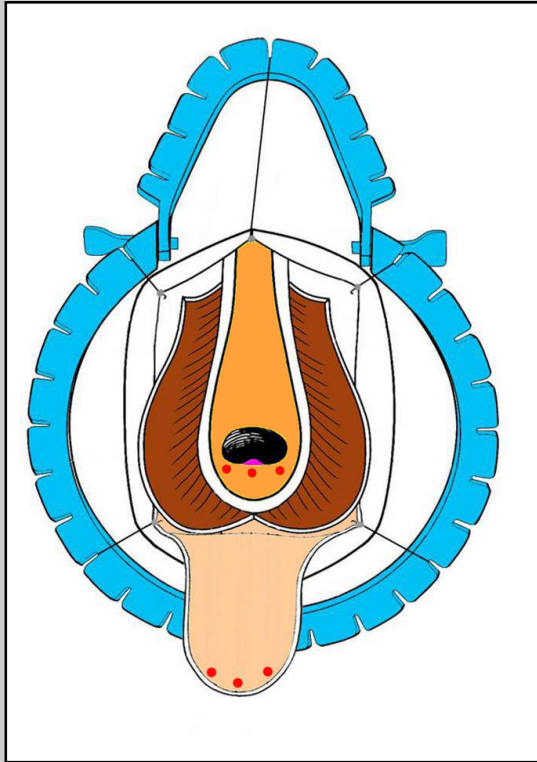
# Webster's technique





# Webster's technique

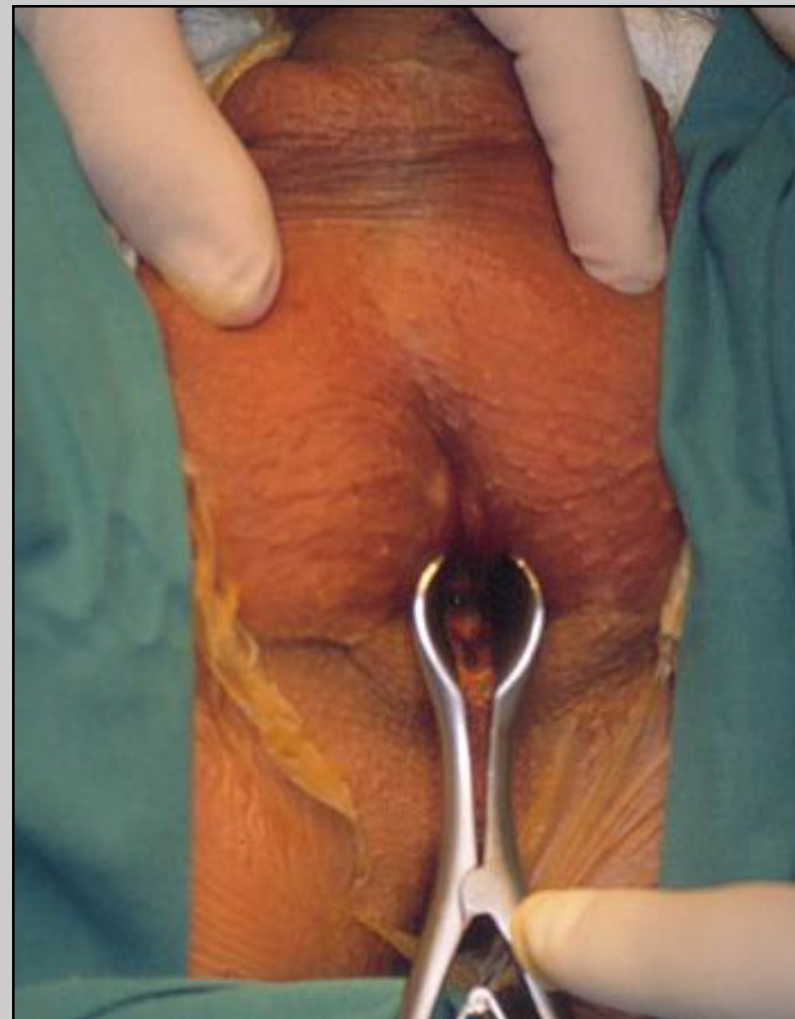


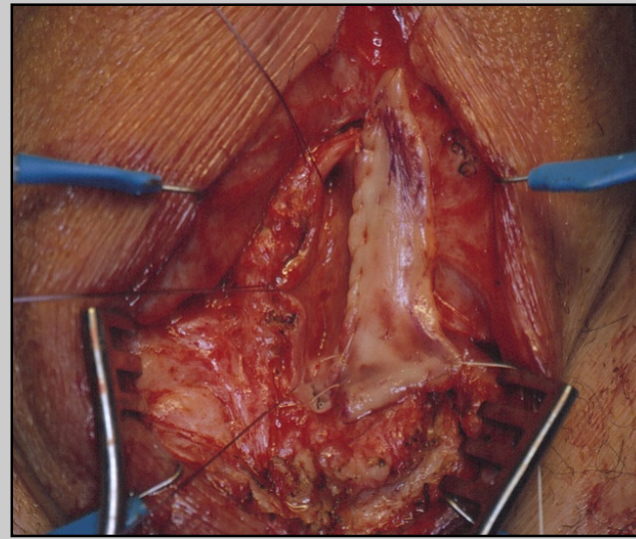
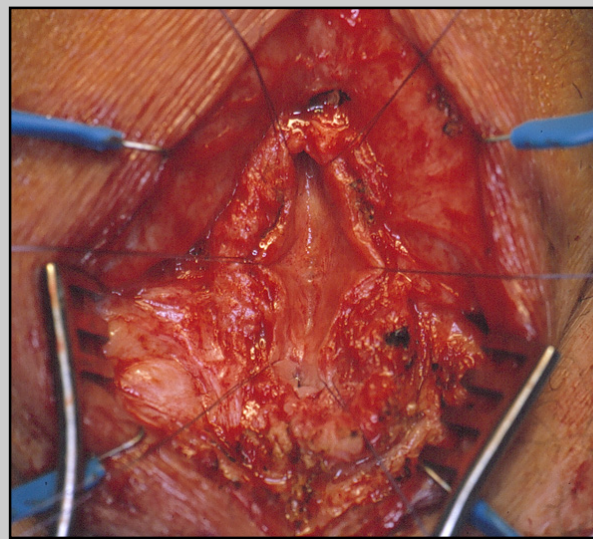




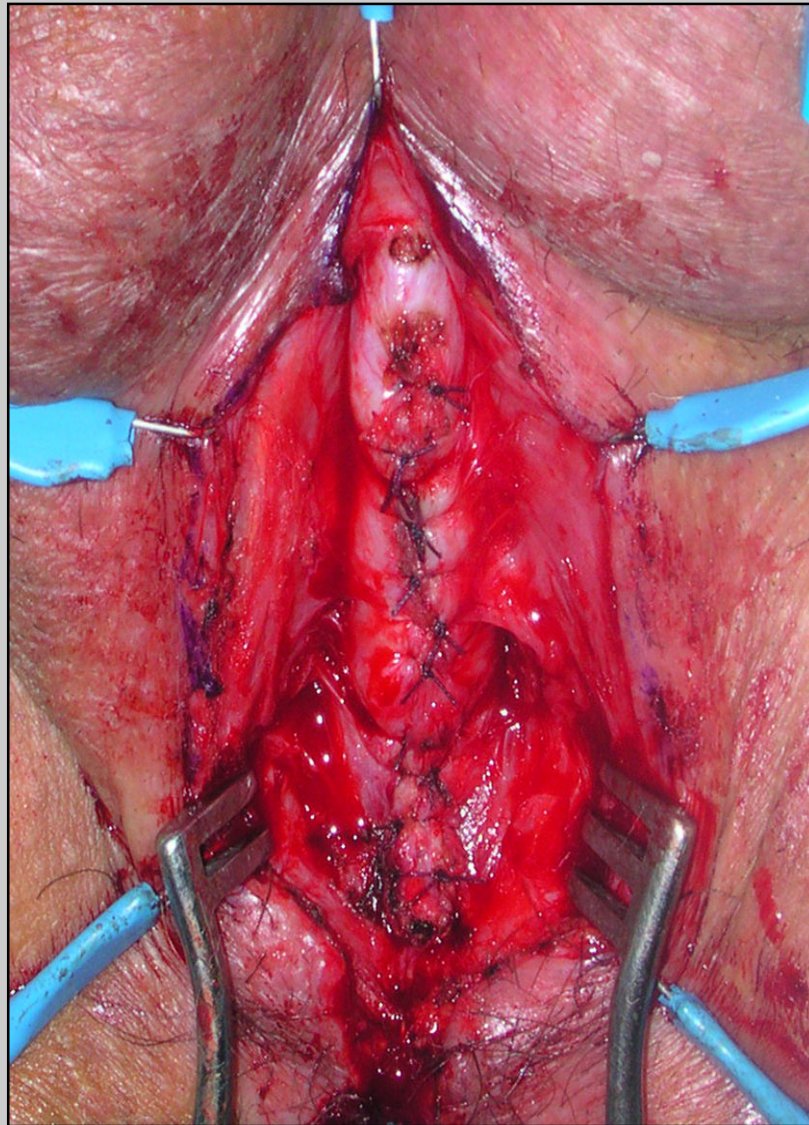
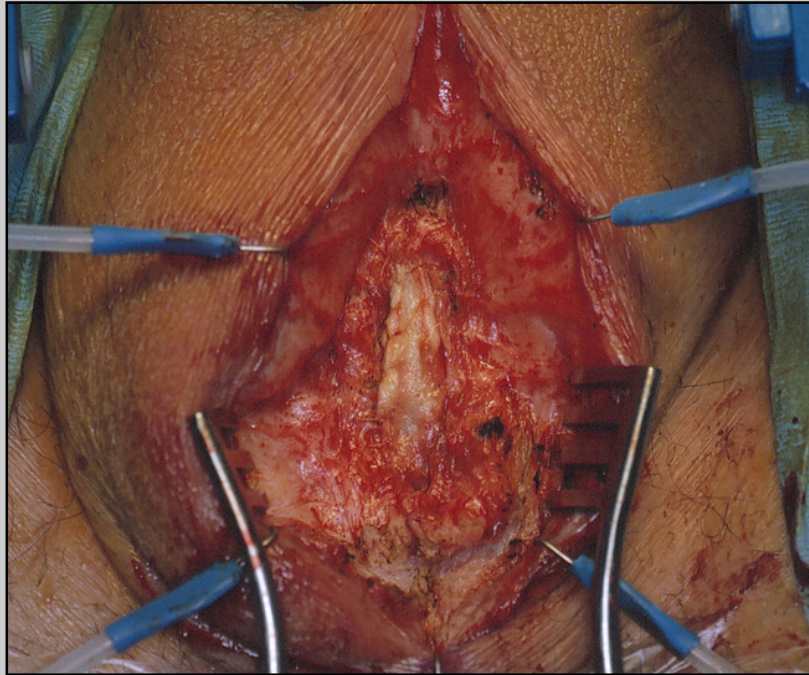


## Second stage





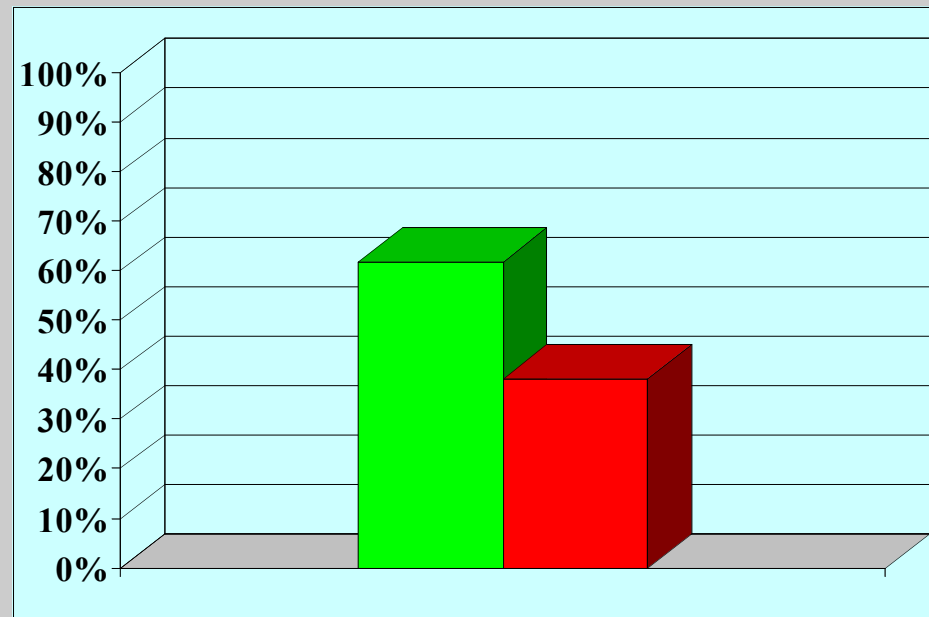






# Results on 55 patients who underwent two-stage urethroplasty

Mean follow-up 66 months (12-198 months)

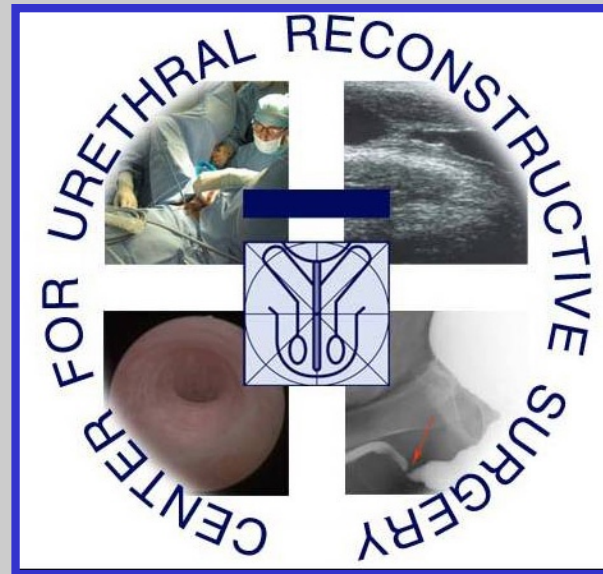


■ success	34 (61.8%)
■ failure	21 (38.2%)

## Conclusions

- **Reconstructive surgery for urethral strictures is continually evolving and the superiority of one approach over another is not yet clearly defined**
- **The reconstructive urethral surgeon must be fully able in the use of different surgical techniques to deal with any condition of the urethra at the time of surgery**

**[www.urethralcenter.it](http://www.urethralcenter.it)**



**Next month, this lecture will be fully available on our website**

**Thank you !**